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HEALTH EVIDENCE NETWORK SYNTHESIS REPORT **67**

What is the evidence on the role of the arts in improving health and well-being?

A scoping review

Daisy Fancourt | Saoirse Finn

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HEN Health Evidence Network
EVIDENCE FOR DECISION-MAKERS

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Abstract

Over the past two decades, there has been a major increase in research into the effects of the arts on health and well-being, alongside developments in practice and policy activities in different countries across the WHO European Region and further afield. This report synthesizes the global evidence on the role of the arts in improving health and well-being, with a specific focus on the WHO European Region. Results from over 3000 studies identified a major role for the arts in the prevention of ill health, promotion of health, and management and treatment of illness across the lifespan. The reviewed evidence included study designs such as uncontrolled pilot studies, case studies, small-scale cross-sectional surveys, nationally representative longitudinal cohort studies, community-wide ethnographies and randomized controlled trials from diverse disciplines. The beneficial impact of the arts could be furthered through acknowledging and acting on the growing evidence base; promoting arts engagement at the individual, local and national levels; and supporting cross-sectoral collaboration.

Keywords

ART, MEDICINE IN THE ARTS, CULTURE, ARTS IN HEALTH

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CONTENTS

ABBREVIATIONS

ASD	autistic spectrum disorder
CVD	cardiovascular diseases
LGBTQ	lesbian, gay, bisexual, transgender and queer
PD	Parkinson's disease
PTSD	post-traumatic stress disorder

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SUMMARY

The issue

Since the beginning of the 21st century, there has been a major increase in research into the effects of the arts on health and well-being. This has occurred alongside developments in practice and policy activities in different Member States across the WHO European Region and further afield. However, because of a lack of awareness of the evidence underpinning these activities, there has been little consistency in policy development across different Member States in the Region. This report aims to close this awareness gap by mapping the current available evidence in the field of arts and health.

The synthesis question

This scoping review addressed the question: "What is the evidence on the role of the arts in improving health and well-being?"

Types of evidence

This report used a scoping review methodology to map the global academic literature in English and Russian from January 2000 to May 2019. Over 900 publications were identified, of which there were over 200 reviews, systematic reviews, meta-analyses and meta-syntheses covering over 3000 studies, and over 700 further individual studies.

Results

The review found evidence from a wide variety of studies using diverse methodologies. Overall, the findings demonstrated that the arts can potentially impact both mental and physical health. Results from the review clustered under two broad themes: prevention and promotion, and management and treatment. In each theme, a number of subthemes were considered:

- within **prevention and promotion**, findings showed how the arts can:
  - affect the social determinants of health
  - support child development
  - encourage health-promoting behaviours
  - help to prevent ill health
  - support caregiving

- within **management and treatment**, findings showed how the arts can:
  - help people experiencing mental illness;
  - support care for people with acute conditions;
  - help to support people with neurodevelopmental and neurological disorders;
  - assist with the management of noncommunicable diseases; and
  - support end-of-life care.

A spectrum of research designs were included: uncontrolled pilot studies, individual case studies, small-scale cross-sectional surveys, nationally representative longitudinal cohort studies, community-wide ethnographies and randomized controlled trials. Research methods included psychological scales, biological markers, neuroimaging, physiological assessments, behavioural observations, interviews and examinations of clinical records. Research studies also drew on theories from diverse disciplines. There is naturally variation in the quality of this evidence, and certain areas where findings remain to be confirmed or understood better. However, this report triangulates findings from different studies, each with a different set of strengths, which can help to address the weaknesses or intrinsic biases of individual studies.

Policy considerations

A number of considerations can be derived from the evidence mapped in this report; these target both the cultural and the health and social care sectors.

Acknowledge the growing evidence base for the role of the arts in improving health and well-being by:

- supporting the implementation of arts interventions where a substantial evidence base exists, such as the use of recorded music for patients prior to surgery, arts for patients with dementia and community arts programmes for mental health;
- sharing knowledge and practice of arts interventions that countries have found effective in their context to promote health, improve health behaviours or address health inequalities and inequities; and
- supporting research in the arts and health, particularly focusing on policy-relevant areas such as studies that examine interventions scaled up to larger populations, or studies that explore the feasibility, acceptability and suitability of new arts interventions.

Recognize the added health value of engagement with the arts by:

- ensuring that culturally diverse forms of art are available and accessible to a range of different groups across the life-course, especially those from disadvantaged minorities;
- encouraging arts and cultural organizations to make health and well-being an integral and strategic part of their work;
- actively promoting public awareness of the potential benefits of arts engagement for health; and
- developing interventions that encourage arts engagement to support healthy lifestyles.

Note the cross-sectoral nature of the arts and health field through:

- strengthening structures and mechanisms for collaboration between the culture, social care and health sectors, such as introducing programmes that are cofinanced by different budgets;
- considering the introduction, or strengthening, of lines of referral from health and social care to arts programmes, for example through the use of social prescribing schemes; and
- supporting the inclusion of arts and humanities education within the training of health-care professionals to improve their clinical, personal and communication skills.

1. INTRODUCTION

1.1 Background

1.1.1 Defining the arts

While the arts have always been conceptually difficult to define, there are a number of cross-cultural characteristics recognized as fundamental to art. These include the art object (whether physical or experiential) being valued in its own right rather than merely as a utility; providing imaginative experiences for both the producer and audience; and comprising or provoking an emotional response. In addition, the production of art is characterized by requiring novelty, creativity or originality; requiring specialized skills; and relating to the rules of form, composition or expression (either conforming or diverging) (1–3).

These criteria provide the boundaries for deciding what constitutes art, but the specific types of art within these boundaries are diverse and fluid. In relation to health research, engagement with the arts has been proposed as consisting of five broad categories:

- performing arts (e.g. activities in the genre of music, dance, theatre, singing and film) (4);
- visual arts, design and craft (e.g. crafts, design, painting, photography, sculpture and textiles) (4);
- literature (e.g. writing, reading and attending literary festivals) (4);
- culture (e.g. going to museums, galleries, art exhibitions, concerts, the theatre, community events, cultural festivals and fairs); and
- online, digital and electronic arts (e.g. animations, film-making and computer graphics) (4).

These categories combine both active and receptive engagement and, importantly, also transcend cultural boundaries and contain flexibility to allow new art forms to develop (as evidenced in the development of online, digital and electronic arts over recent years). For the purposes of this review, this conceptual definition of art (combining common attributes but allowing fluidity in categorization) is followed. While there are other activities that fulfil many of the categories listed above (e.g. gardening, cooking and volunteering), consensus research has suggested these may be seen as creative but are not generally considered as arts, particularly when cross-referenced with definitions from national arts councils (5–7); consequently,

these were not included in the review (4). Similarly, this review did not focus on architecture or the design of buildings. However, some secondary references to the use of visual art in health settings are made.

1.1.2 Defining health

WHO defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (8), thus rooting health firmly within society and culture. It emphasizes the importance of illness prevention and, consequently, the determinants of health: how health is shaped by the cultural constructs within which it is situated and how it can be promoted at both an individual and a society level (9–11). The definition also focuses on being well, from an individual perspective (12–14) and socially (15). The latter can include multiple aspects such as integration within society, contribution to society, acceptance and trust within society, individual understanding of society and belief in the potential of society (15).

In the decades since 1948 when this definition of health was published, the concept of health has expanded further (16). Complete health and well-being may not be everyone's goal. For example, the presence of a chronic mental or physical illness is not necessarily a sign of being ill but may be something that can be managed (17). Management is shaped in part by resilience and whether individuals can adapt with their health: whether they can restore their physiological homeostasis (balance) and feel they have the capacity to cope and fulfil their potential with a degree of independence and opportunity to participate socially (18–20). Health is, therefore, a dynamic process that, at its core, is about having the capacity to self-manage.

1.1.3 Linking the arts with health

Arts activities can be considered as complex or multimodal interventions in that they combine multiple different components that are all known to be health promoting (21). Arts activities can involve aesthetic engagement, involvement of the imagination, sensory activation, evocation of emotion and cognitive stimulation. Depending on its nature, an art activity may also involve social interaction, physical activity, engagement with themes of health and interaction with health-care settings (Fig. 1) (22).

Fig. 1. A logic model linking the arts with health

Components

- Aesthetic engagement
- Involvement of the imagination
- Sensory activation
- Evocation of emotion
- Cognitive stimulation
- Social interaction
- Physical activity
- Engagement with themes of health
- Interaction with health-care settings

Responses

- **Psychological** (e.g. enhanced self-efficacy, coping and emotional regulation)
- **Physiological** (e.g. lower stress hormone response, enhanced immune function and higher cardiovascular reactivity)
- **Social** (e.g. reduced loneliness and isolation, enhanced social support and improved social behaviours)
- **Behavioural** (e.g. increased exercise, adoption of healthier behaviours, skills development)

Outcomes

- **Prevention**
- **Promotion**
- **Management**
- **Treatment**

Each of the component parts of arts activities can trigger psychological, physiological, social and behavioural responses that are themselves causally linked with health outcomes. For example, the aesthetic and emotional components of arts activities can provide opportunities for emotional expression, emotion regulation and stress reduction (23). Emotion regulation is intrinsic to how we manage our mental health (24,25), while stress is a well-known risk factor for the onset and/or progression of a range of health conditions including cardiovascular diseases (CVD) (26) and cancers (27). Cognitive stimulation when engaging in the arts can provide opportunities for learning and skills development, and it is not only associated with a lower risk of developing dementias but also interrelated with mental illness such as depression (28). Social interaction while participating in the arts can reduce loneliness and lack of social support, which are both linked with adverse physiological responses, cognitive decline, functional and motor decline, mental illness and premature mortality (29,30). Social interaction that brings together different groups of people can improve social capital and reduce discrimination, the latter being linked with mental illness and a range of other health conditions including CVD, respiratory conditions and indicators of illness such as pain and headaches (31). Physical activity through participating in the arts can reduce sedentary behaviours, which are associated with conditions such as chronic pain, depression and dementia (32). Engagement with discussions of health or with health-care settings through arts activities can also help to encourage health-promoting behaviours such as having a healthy diet and not smoking or drinking too much, which are all linked with a lower risk of mortality from CVD and cancer (33). Further, such discussions can encourage engagement with health services, such as visiting the doctor for check-ups or screening, which is associated with better control of pre-existing health conditions and a lower risk of mortality (34).

Overall, each of the arts categories outlined in section 1.1.1 involves different combinations of these health-promoting components, whether undertaken in everyday life (not for a health purpose but having a secondary benefit for health) or within bespoke arts programmes designed with targeted health or well-being goals, or therapeutic arts programmes delivered by trained arts therapists (22). For certain populations, or when aiming to influence certain health conditions, particular types of arts activities (whether everyday, bespoke or therapy) and particular art forms may be more suitable than others as they may combine specific relevant components (e.g. dance is particularly relevant for rehabilitation as it is a physical activity). For other populations or health conditions, the deciding factor as to which type of programme or art form is most appropriate may be driven largely by personal taste and cultural influence. Indeed, this is proposed as a strength of arts projects

within health: while other activities can also contain different health-promoting components (e.g. exercise activities), the arts combine many health-promoting factors with an inner aesthetic beauty and creative expression that provide an intrinsic motivation for engaging beyond a particular regard for good health (22). A further strength is that the multimodal nature of arts interventions means that engagement can be associated with a number of different effects on health.

Consequently, this report explores the wide-ranging effects of multiple different types of arts activity and will distinguish between the following broad types of effect:

- where research suggests that multiple types of arts activity could achieve similar outcomes, activities will be referred to as arts engagement or engaging in the arts;
- where evidence suggests that specifically participation is important (to differentiate from visiting cultural venues or attending events), activities will be referred to as participating in the arts or arts participation; and
- where evidence suggests that one particular type of activity may be particularly effective (e.g. listening to music or dance), this will be specified.

1.1.4 Objectives of this report

There have been many policy developments across the WHO European Region relating to arts and health since the early 2000s. For example, in England (United Kingdom), joint publications between Arts Council England and the National Health Service have been produced since 2007 (35,36); the Department of Culture, Media and Sport has included health within the new Culture White Paper (37); and an All-Party Parliamentary Group report Creative Health has made a series of political recommendations to the United Kingdom Government and other bodies (38). In Finland, the Government adopted a policy programme for health promotion in 2007 that focused on enhancing the contribution of art and culture to health and well-being (39). In Ireland, Arts Council Ireland and the Health Service Executive have been collaborating since the late 1990s, producing policy and strategy documents on the potential for collaboration between the arts and health sectors (40). In Norway, the Government has instituted a public health law and a cultural law, with both emphasizing the importance of arts in health promotion and care (41). In Sweden, the Swedish Parliament has started a Society for Culture and Health and a Cultural Politics Commission (42). Further political developments are discussed elsewhere (22,43).

However, developments in this field have largely had a national focus, aiming to influence policy and practice in individual countries, with only limited examples of cross-country influence (44). This means that there has been little consistency in policy development or even in sharing good practice, and many efforts of individual countries have remained short term rather than being long lasting. This report, therefore, seeks to map the growing evidence base on the arts and health that has arisen since the start of 2000 and proposes a set of policy considerations that will promote the cohesion and longevity of policy development in this field.

For WHO, the increasing interest from arts sectors in health is particularly timely and dovetails with a number of important developments in the global health policy arena. Building on the Health in All Policies approach articulated in the early 2000s, Health 2020, the European health policy framework, highlights the importance of multisectoral collaboration for catalysing action (45). This strategic shift has been further underlined by the recently published WHO Thirteenth General Programme of Work 2019–2023 (46), which also promotes a greater focus on both well-being and increasing human capital throughout the life-course. Furthermore, the 2030 Agenda for Sustainable Development (47) includes supporting good health and well-being, providing quality education, building sustainable cities and communities, encouraging decent work and economic growth, and working in partnership. All of these goals, priorities and approaches are integral parts of engaging with the arts, increasing the cultural capital within societies and potentially helping to promote resilience, equity, health and well-being across the life-course. Finally, because they operate simultaneously on the individual and social, as well as physical and mental, levels, arts-based health interventions are uniquely placed to address the full complexity of the challenges that being healthy and well are increasingly recognized to present.

1.2 Methodology

This scoping review addressed a broad synthesis question with the priority of gaining an expansive picture of the available evidence. Therefore, it focused specifically on the results from meta-analyses, meta-syntheses and meta-ethnographies. However, it also includes references to the results of individual studies and some grey literature. In particular, this report did not aim to discriminate between different research methodologies or methods but instead includes a diverse range of evidence in order to highlight both the depth and the breadth of research in this field.

Annex 1 gives details of the methodology, including the search strategy and keywords used for the arts and health.

2. RESULTS

In all, over 900 publications were included in this report, of which there were over 200 reviews, systematic reviews, meta-analyses and meta-syntheses covering over 3000 studies, and over 700 further individual studies.

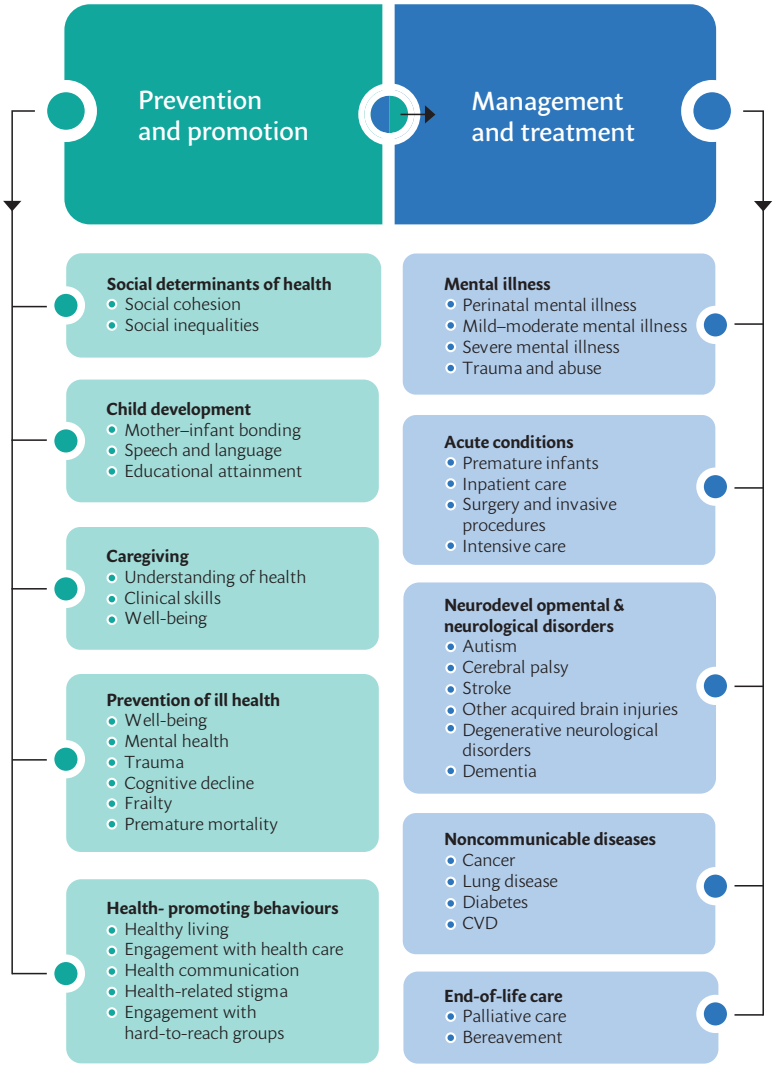
Our thematic coding of the findings suggested two broad themes: prevention and promotion; and management and treatment (Fig. 2). In relation to prevention and promotion (section 2.1), several subthemes were identified.

1. How the arts affect social determinants of health (e.g. social cohesion and social inequalities and inequities).
2. How the arts support child development (including mother–infant bonding, speech and language acquisition, and educational attainment).
3. How the arts encourage health-promoting behaviours (e.g. through promoting healthy living and encouraging engagement with health care, through their role in health communication, reducing health-related stigma and engaging marginalized or hard-to-reach groups).
4. How the arts help to prevent ill health (including enhancing well-being and mental health, reducing the impact of trauma, and reducing the risk of cognitive decline, frailty and premature mortality).
5. How the arts support caregiving (including enhancing our understanding of health, improving clinical skills and supporting the well-being of formal and informal carers).

In relation to management and treatment (section 2.2), several additional subthemes were identified.

1. How the arts help people experiencing mental illness (e.g. perinatal mental illness, mild–moderate mental illness, severe mental illness, trauma and abuse).
2. How the arts support care for people with acute conditions (e.g. care of premature infants, hospital inpatients, people undergoing surgery and invasive procedures, and individuals in intensive care).
3. How the arts help to support people with neurodevelopmental and neurological disorders (including autistic spectrum disorder (ASD), cerebral palsy, stroke, other acquired brain injuries, degenerative neurological disorders and dementias).
4. How the arts assist with management of noncommunicable diseases (including cancer, respiratory disease, diabetes and CVD).
5. How the arts support end-of-life care (including palliative care and bereavement).

Fig. 2. Thematic content for prevention and promotion and management and treatment



2.1 Prevention and promotion

2.1.1 How the arts affect social determinants of health

2.1.1.1 Social cohesion

There is a wide literature on the potential evolutionary role of the arts (in particular, music) in enhancing social bonding (48–50). In support of these theories, the arts have been found to foster prosocial behaviour, a shared sense of success, physical coordination, shared attention, shared motivation and group identity (51). For music specifically, experimental studies have shown the effects of individual singing sessions, in both small and large groups, on self-perceptions of social bonding, social behaviours and oxytocin levels (51–53), demonstrating faster social bonding through music than with other social activities (54). Aspects of exertion, synchronization, self–other merging and endogenous opioid release have been identified as key mechanisms underlying music-led bonding (50). Further studies have particularly shown the benefits of music for bonding between mothers and infants (section 2.1.2). The arts also provide a recognized way of reducing loneliness and social isolation (55), particularly among people living in rural or disadvantaged areas (56–58). Activities that involve the simultaneous engagement of multiple individuals, for example group participation in activities such as crafts and singing, are particularly effective at fostering cooperation, self-concept and a sense of social inclusion for children, adults, families and communities and across different cultures (59–62). Engagement with the arts can also lead to greater prosocial behaviours within communities, including volunteering and charitable giving (63), and can enhance social consciousness (64). The arts can also form a bridge between different groups; for example, activities such as dance, arts classes and theatre have been shown to foster greater social inclusion in patients with dementia and their carers (65), children and adults with and without disabilities (66,67), police and ex-offenders (68) and adults across different generations (69). This all builds social and community capital within societies (70,71).

Relatedly, the arts have been shown to help build social cohesion and support conflict resolution through developing cognitive, emotional and social skills for constructive engagement with conflict, and by supporting empathy, trust, social engagement, collaboration and transformative learning, thereby producing more cooperative relationships (59). Among indigenous communities, the arts can help to preserve cultural traditions and promote identity and resilience (72). Between different cultural groups, the arts (including film and literature) can help to reduce ethnic tensions and improve interethnic relations and cultural

competence (73–75). Refugees and asylum seekers have reported that engagement with the arts following forced displacement supported them in creating new support networks and developing practical skills that were useful in finding work (76). Songs promoting social inclusion can reduce prejudice, discrimination and aggression between groups and promote cultural understanding (77,78). Fiction reading has been shown to improve social cognition and prosocial behaviours (79,80). Further, the creativity involved in arts participation is thought to develop creative thinking, problem solving and the reconstruction of beliefs (81,82). It is, consequently, understandable that a number of projects have used the arts in international and local mediation. Examples include the use of theatre projects in Bosnia and Herzegovina to support reconciliation following armed conflict; joint folk-art exhibitions in Boston (United States of America) to bring together Jewish and Palestinian diaspora communities; and music projects in Norwegian schools to help change attitudes towards migrants among young pupils through exposure to music from around the world (83).

2.1.1.2 Social inequalities and inequities

Programmes using the arts to address both social inequalities (uneven distribution of health or health resources) and inequities (unfair avoidable differences in society and the environment that can shape health) have been developed across higher- and lower-income countries, including in Canada (Quebec), Finland, Lithuania and Latin American countries. These have had a shared focus on using the arts to promote social inclusion, skills development, capacity-building and health promotion (84). For example, among children specifically identified as at risk (e.g. living in areas characterized by high levels of economic deprivation, substandard housing, a lack of health care and social isolation), music has been found to reduce anxiety, depression, emotional alienation, truancy and aggression, as well as increasing school attendance, self-esteem, cultural empathy, confidence, personal empowerment and healthy nutrition (85). Among children exposed to ongoing maltreatment and poverty, group music can help to prevent the development of depression, anxiety, attention problems and withdrawal (86). Large-scale community-based music programmes for children exposed to violence have been found to improve self-control and reduce behavioural difficulties (87). Among potentially dissident young people, circus skills programmes can help to improve coping for individuals within the existing socioeconomic system, build skills, and develop productive and cooperative citizens (88). Among adolescents living in urban areas, drama-based peer education can support responsible decision-making, enhance well-being and reduce exposure to violence (89). Further, the arts can be used to support regeneration programmes: inner-city housing projects incorporating the arts have

been found to improve the built environment, enhance social cohesion and decrease levels of violent crime, thus leading to safer places (90). The arts also provide job opportunities and support social mobility, employment and socioeconomic stability for both individuals and communities (91–95). For many of these programmes, the location of arts activities in community or bespoke arts venues is important, as these sites can provide a third arena of learning for young people (alongside the classroom and the home; Case study 1) (97,98).

Case study 1. Sistema Europe

In 1975, El Sistema Venezuela was established by musician José Antonio Abreu as a music education programme aiming to achieve social change and justice for children in poverty living in Venezuela. Since its inception, over 700 000 children have taken part from 420 local communities and the programme has spread globally including to 127 locations across Europe, including in Austria, Belgium, Bosnia and Herzegovina, Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lichtenstein, Luxembourg, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Like El Sistema Venezuela, Sistema Europe provides orchestral and vocal ensemble musical training for young people from all sections of society, with a focus on individuals from low economic backgrounds and with the highest need (96). The orchestras rely on different forms of funding provided through a mixture of corporate sponsorship, private sources via trusts and foundations, public support, and donations including from lotteries. Performances are further used to generate income. Children generally receive their training free of charge through schools and the community. The aim of this training is to help young people to maximize their full musical potential through intensive musical practice; at the same time, the training helps them to develop other life skills, promotes new opportunities and fosters social integration and inclusion. Programmes are tailored for different cultures across Europe and include regular concerts.

At an individual level, evaluations of the programme have highlighted benefits for children's development (e.g. self-confidence, maturation and motivation to succeed), educational attainment (e.g. improved attention, language skills, memory and communication skills) and social behaviours (e.g. prosocial behaviours). At a group level, Sistema music camps have been used to facilitate social cohesiveness, such as through hosting joint performances between

Case study 1 contd

orchestras in Austria and Turkey as part of a Human Rights Film Days Festival in 2017, and through hosting partnership camps in 2018 between Bosnia and Herzegovina, Croatia and Serbia to facilitate the building of friendship among the former Yugoslavian countries (96).

2.1.2 How the arts support child development

2.1.2.1 Mother–infant bonding

The arts play an important role in child development. Indeed, there is a wealth of anthropological and psychological literature suggesting that music, in particular, evolved as a cross-cultural adaptation to support mother–infant interactions (48–50,99,100). It has been proposed that singing developed directly out of motherese: a style of infant-directed speech consisting of exaggerations, elevated pitch, slow repetitions and melodic elaborations of ordinary vocal communication (101–104). Specifically, fetuses can respond to sound as early as 19 weeks into pregnancy (105,106), and infants have a natural tendency to seek auditory entrainment soon after birth (akin to the regular maternal heartbeat in the womb) (107). Mother–infant singing has been found to enhance maternal nurturing behaviours, reduce stress hormones in mothers and their infants, and increase perceived emotional closeness and the mother–infant bond (108–111). As infants grow, multiple further studies have shown that singing can affect a number of behaviours associated with mother–infant bonding, including modulating infant arousal and supporting emotional synchronicity between mother and infant; this leads to more intense engagement, visual attention and movement reduction than occurs with speech (112,113). Arts and shared reading activities have also been found to improve parent–child relationships as children grow up, including the perceived acceptance of a child by its mother and both parental and child psychosocial functioning (114,115).

2.1.2.2 Speech and language

Music plays an important part in language development. The simple melodic arches used in singing and motherese are cognitively easier to process than words, so they support mother–infant communication and language development while babies are at a relatively early stage of neurological development (116). Reports of benefits for language development extend across early years and childhood (117,118), as well as benefits for auditory skills development (including auditory discrimination and attention (119)), reading ability (120) and language skills (including

pitch perception (121–123)). Benefits are also found from other arts activities such as theatre programmes for pre-schoolers to improve verbal communication (124) and picture storybook reading for infants at any age from 3 months to 6 years (125,126). These, and other activities such as dance, can all enhance developmental maturity and school readiness (127).

These results have been found to extend to deaf children (128), children with dyslexia (129), children with communication difficulties (130), children with developmental disabilities (131) and those with particularly low reading levels (132). Participation in arts activities can reduce the emotional impact of speech disorders, with reductions in anxiety and fear (133). Singing may also help children who stutter by reducing stress and using melodic architecture to help in the formation of longer verbal phrases (134,135). For children who are deaf and have cochlear implants, musical training in playing an instrument has been found to improve discrimination of melodic contour and rhythm and emotional speech prosody perception (136). For children and adolescents with Rett syndrome (a genetic brain disorder associated with problems with language and coordination), regular music therapy can improve receptive language and verbal and nonverbal communication (137).

2.1.2.3 Educational attainment

A number of studies have shown structural differences in grey matter and white matter in children who engage in music (especially during early childhood) compared with those who do not (138–142). Reports of these effects have extended to at-risk groups, such as children born prematurely or to dyslexic parents (143), and seem to be particularly supported by music above other forms of arts engagement, perhaps because of the breadth of brain regions involved in music processing (144). Whether these structural changes lead to higher intelligence, better memory or stronger cognitive processing across childhood is debated (145–148). However, a number of studies have reported neural changes and significant differences in associated reading skills, sound-processing skills and speech (149–151).

Studies have also suggested that childhood engagement in arts activities can predict academic performance across the school years, with earlier commencement associated with larger effects (152–157). These effects may not be wholly a result of transfer of cognitive training from one activity to another but may also be explained, in part, by two other factors: individual development of motivation, perseverance and reward through arts engagement, which is highly supportive of learning outcomes (158); and improved behaviours. For example, engagement with musical rhythms at a young age supports synchrony in social development

and more altruistic behaviour between children and adults (159), which is a key factor in supporting learning. Engagement with arts activities such as dance or the presence of background music can increase attention in the classroom (160–162). The arts also promote prosocial classroom and playground behaviours (163–165), enhance emotional competence among children that supports their engagement with learning (166,167), reduce competitive dynamics in classrooms (168) and reduce bullying (169–171). The arts facilitate creativity in children and adolescents (including autonomy, competence and relatedness) (162,172,173), with creativity in childhood associated with a lower risk of developing social and behavioural maladjustment issues in adolescence (174). It is also noticeable that young children whose parents read to them before bed have longer night-time sleep, which could support their concentration at school (175).

These behavioural benefits also extend to specific groups. For children from lower-income backgrounds or at risk of poorer socioemotional development and academic performance, music classes can improve social skills and reduce stress hormone levels, hyperactivity, autistic behavioural tendencies and problem behaviours (176–178), all of which support academic performance. For young people with social, emotional and behavioural difficulties, arts therapy can improve behaviours, particularly through improved communication (179). For children and adolescents with specific psychopathologies such as a past history of sexual abuse, developmental delay or emotional disturbance, music can improve self-confidence, self-esteem and self-concept (180). For children with learning disabilities, the arts help to support interpersonal relationships in the classroom and the recognition of emotions in their peers (181), thus supporting good behaviour. For adolescents who are visually impaired, music therapy can reduce aggression (182). For children with dyslexia, musical activities that involve both sensory and motor systems have been shown to improve auditory perception, auditory attention and reading ability (183,184). For children with physical or developmental disabilities, theatre interventions can improve communication and social and behavioural functions (185,186). Case study 2 describes support given by the Finnish Government for arts and culture within education.

Case study 2. Observatory for Arts and Cultural Education, Finland

Finland has a history of government support for the arts and culture within education with the aim of strengthening children's creative skills, cultural competence, and individual and social well-being, as well as supporting wider determinants of health such as educational attainment. Music, visual

Case study 2 contd

arts, and arts and crafts are core subjects in comprehensive primary schools, and students in upper secondary education must take and complete five compulsory arts and skill courses in music, arts and physical education. In vocational education, compulsory core studies also include arts and skills subjects, and there are wider opportunities for children and young people through community arts programmes in municipalities and arts education in afternoon clubs and day care. There is also continuous arts education available for teachers (187).

To support this work, the Finnish Observatory for Arts and Cultural Education was established in 2017 as part of a Government project entitled Access to Art and Culture, financed by the Ministry of Education and Culture (188). The Observatory is made up of the Centre for Educational Research and Academic Development in the Arts (part of the University of Arts Helsinki) and the Association of Finnish Children's Cultural Centres in cooperation with Aalto University, the Finnish National Agency for Education, Taiteen Perusopetusliitto (a Finnish association for basic education in arts) and the University of Lapland.

The aim of the Observatory is to reinforce equal accessibility and effectiveness of arts education across Finland, as well as to raise the profile of the field, in order that the health, well-being and wider benefits of the arts can be experienced by all children. It does this through collecting and disseminating information on practices, research and policies across Finland; developing research tools and materials; and supporting the implementation of evidence-informed practice (188). The Observatory is also a member of the European Network of Observatories in the Field of Arts and Cultural Education, which enables comparisons of Finnish practices and research findings with those of other countries and supports the sharing of good practice.

2.1.3 How the arts encourage health-promoting behaviours

2.1.3.1 Healthy living

There is promising preliminary evidence from individual observational studies that people who engage with the arts are more likely to lead healthier lives, including eating healthily and staying physically active, irrespective of their socioeconomic status and social capital (189). Engagement with community activities such as

arts and crafts has been shown to improve general self-perceived health and aspects of mental health and well-being, with these changes being associated with improvements in the enjoyment of both healthy eating and physical activity, and increases in the perceived value of putting care and effort into food (190–192). Drama activities in schools focused on nutrition and healthy eating have been found to improve children's nutritional knowledge and healthy eating attitudes (193) and improve self-esteem associated with body image (194). For adolescents who are overweight, diet-related drama activities have been found to improve knowledge, attitude, and healthy diet and exercise behaviour, as well as reducing body mass index (195). Dance can be more effective than exercise in reducing body fat (196,197), possibly through the role of music in improving mood and helping to maintain attention (198). Additionally, listening to music, playing an instrument and reading for pleasure are associated with a lower waist–hip ratio and waist circumference in adolescent girls (199) and better maintenance of waist circumference in men (200). Playing a musical instrument is associated with a lower risk of becoming overweight in adolescent boys (201). Weekly dance therapy over several months for those who are obese can also improve body consciousness, mental representations linked to body image and perceived competence to exercise regularly (202,203).

In relation to exercise, a large number of studies have shown the ergogenic, psychological and psychophysiological benefits of music during high-intensity exercise (204). A number of factors underlie this: musical beats lead to the entrainment (synchronization) of brainwaves (205); activate brain regions that trigger muscle movement (206,207); stimulate steroid hormone response and arousal centres in the brain (208–211); inhibit certain physiological feedback signals, such as exertion and fatigue (212); and support positive emotional states that enhance happiness and optimism (204). Relatedly, dance activities have been found to improve body composition (including body mass index and total fat mass), blood biomarkers (including cholesterol, triglycerides and markers of oxidative stress) and musculoskeletal function (including balance, sit-ups and sit-to-stand time) (213–215). These results were significantly greater than those seen with regular exercise interventions in many studies, and effects were seen in both overweight people and people with a healthy weight (213–215).

In relation to drugs and tobacco, drama projects have been found to increase awareness of the dangers of illegal drugs (216), as well as helping to prevent or reduce illegal drug use in adolescents (217–219). Regular activity sessions combining music and games with stories focused on increasing empowerment have been found to decrease marijuana and alcohol use in high-risk adolescents (220), while

song-writing workshops have been found to reduce cravings in patients with substance use disorders, probably through distraction, engagement and motivation (221). Interventions using the arts in relation to drug and tobacco use have occurred in both community- and school-based initiatives. Plays about substance abuse have also been found to increase the participation of adults in substance abuse prevention initiatives, including the donation of money to prevention activities (222). For tobacco, videos and videogames have been found to improve knowledge relating to the dangers of cigarettes and raise awareness about e-cigarettes, as well as potentially modulating the intention to quit smoking (223,224), particularly if people can relate to the characters (225). Arts events such as festivals were also found to be strong sites for having conversations about tobacco and broader health, with promising results for delivering messages about topics such as smoking and the importance of sun protection (226,227). Indeed, compared with sporting events, arts events were found to be as effective for promoting antismoking awareness and to have twice the effect on individuals' intentions to act (226).

In relation to sexual behaviours, stories portrayed in television dramas have been found to reduce the number of sexual partners among young people, reduce unprotected sex and increase testing for and management of sexually transmitted infections (228). Similarly, interactive video games involving adventure stories were found to improve sexual health attitudes and knowledge (229).

2.1.3.2 Health communication

The arts are powerful tools for health communication: they can be used to engage specific populations through culturally resonant activities; transcend language barriers; appeal to people emotionally and humanize issues around health; embody concepts and demonstrate what individuals can do proactively themselves; and empower individuals and communities through collaborative engagement (230). The arts can be used to communicate in a way that is sensitive to local cultural traditions and challenges and to cross the hierarchical divisions and tensions that can exist in health communication. Artists can act as mediators between public health professionals and members of the public and can support individuals in taking responsibility for their own health (230,231). Because many health communication programmes involving the arts are community based, they also build on existing social networks and social capital, providing a culture-centred rather than individual-centred approach (232). Meta-analyses of international studies have noted improvements in knowledge, attitude and behaviours from projects involving performing arts (e.g. plays, songs and dance), interactive activities (e.g. role play and the creation of radio plays and stories) and visual arts (e.g. murals, posters

and installations) (233,234). While there is no consensus that any one type of arts programme is the most effective, results appear to be strongest when individuals and communities are actively involved in the creation of the art (235).

In addition to the literature surveyed in section 2.1.3.1 on physical activity and diet, further projects have focused on conveying messages related to both communicable diseases and broader health. Projects relating to communicable diseases include developing hip-hop songs and soap opera videos on prevention for young people with or at high risk of HIV (236–240); educating about the transmission factors for malaria and cholera through community arts (241); communicating symptoms of Ebola virus through rap songs, murals and theatre performances (242); combating anti-vaccine misinformation through storytelling (243); educating children about personal hygiene using storytelling and drama (244); and providing sexual health messages to prisoners, ex-inmates and families through radio (245). Projects relating to broader health include improving diabetes management in children (246), providing health and social education to homeless adults through art classes (218), teaching women about breastfeeding through song (247), supporting family planning and responsible parenthood in young people through music videos (248,249), educating new parents about child developmental milestones through comics (250), raising awareness about domestic violence among policy-makers through drama workshops (251), supporting children's understanding of mental health through school-based arts programmes (252), raising awareness about child sexual abuse among children and parents through children's theatre (253), reducing stigma surrounding abortion through selected readings in book clubs (254), improving intentions to call emergency services in the event of a stroke through culturally targeted films (255), educating train travellers through visual and participatory arts activities about poor mental health to try to avoid railway suicides (256), and encouraging attendance at colorectal cancer screenings (257).

It has been noted that arts-based approaches are particularly helpful when working with multicultural groups (239), when trying to encourage individuals to become health promotion practitioners themselves (239), when trying to build trust around sensitive health topics (232), and when musicians or artists hold a local status as opinion leaders and agents of social change (258).

2.1.3.3 Engagement with health care

The arts can also improve engagement with primary health care. Doctors' surgeries that have visual art on the walls to maximize patient comfort have been found to have reduced patient anxiety, increased satisfaction with patient–doctor

communication and improved staff satisfaction (259). Calming music in dental surgeries can reduce levels of self-reported anxiety, fear, blood pressure and stress hormones in patients (260–262). Virtual reality relaxation films can reduce pain and distress in both adults and children and improve behaviour during dental examinations in children (263,264). Play therapy involving activities such as drawing can also reduce stress levels in children undergoing dental treatment (265). Further, cartoon animations have been shown to improve dental health awareness, while singing toothbrushes designed to increase the quality of brushing have been found to improve oral health (266).

Arts venues can also be used as sites for supporting people with unmet health needs. For example, libraries have not only been shown to be beneficial for the health of users (267) but can also be used as sites for arts-in-health interventions such as reading for mental health (268). There is an increasing number of libraries offering timetabled health programmes, drawing on the familiarity of the community space to engage hard-to-reach groups (269). Arts-based community health programmes have also been shown to increase engagement with health services (270).

Building on the work on health communication, arts projects have also been linked to improvements in medication and treatment adherence: storytelling interventions have been found to improve hypertension and medication adherence (271); art and music workshops have been found to improve the management of diabetes in children and of sickle cell disease in adolescents (246,272); songs carefully selected to enhance self-efficacy and attitudes in those with HIV (e.g. with messages such as "you can do it" and "take a dose every day") have been found to increase adherence self-efficacy and decrease viral loads (273,274); and apps that gamify cancer treatments for adolescents have been shown to improve uptake of and adherence to chemotherapy (275).

2.1.3.4 Health-related stigma

The arts have been used to reduce stigma associated with certain health conditions. Arts programmes in schools have been used to improve mental health literacy, empathy and inclusion (276,277). Arts festivals have been found to increase positive attitudes towards mental health (278), increase appreciation of the abilities and creativity of people with mental illness (279) and increase perceived collective efficacy within communities to improve mental health care (280). Drama has been used to address mental health stigma, with theatre productions on bipolar disorder found to reduce stigma in the short term among health-care providers (281). The Rural Art Roadshow initiative has been used to build community resilience, reduce

stigma and promote a positive image of mental health in remote communities (282). In psychiatric inpatient units, song-writing has been found to reduce levels of experienced stigma, self-stigma and total stigma (283). Patterns in national press articles suggest a growing use of the arts to destigmatize mental illness, including challenging the belief that individuals with mental illness are incapable of work, thus highlighting the role of the arts in facilitating return to employment and breaking down barriers between those with and without mental illness (284). Storylines in major television sitcoms have been used to help to reduce the secrecy and shame surrounding postpartum psychosis (285). In particular, feelings of relatedness towards protagonists in such storylines were found to be a key factor in their success as an intervention (286).

Physical health issues such as living with HIV or dementia can also be tackled effectively by the arts. Photo stories, creative activities and fiction writing have been found to disrupt stereotypes about HIV and to provide cathartic opportunities and increase social support among people with HIV (287,288). They also have an impact on health professionals by humanizing people with HIV by increasing the professionals' understanding and supporting empathetic emotional responses (289,290). Drama performances about dementia, poetry projects and community choirs for people with and without dementia have been found to increase the understanding of dementia, shift negative attitudes and reduce stigma (291–293). The arts have also been found to promote broader health equity: arts programmes and theatre projects have increased the understanding of the health and fertility needs of individuals who are lesbian, gay, bisexual, transgender or queer (LGBTQ) or of another gender minority and have also increased empathy and self-reflection of personal biases (294,295). Films have also been shown to improve parental attitudes towards children who are LGBTQ (296).

2.1.3.5 Engaging marginalized or hard-to-reach groups

The arts are also effective in reaching groups who are either less likely to engage in health care or experience more barriers to engaging. The arts have been used to build trust between children in foster care or in contact with social care and social workers, leading to increases in the children's self-esteem, resilience, skills development, empowerment and social support networks (297). Hip-hop, music, poetry, and street and circus arts have similarly been used to build trusting relationships with people in the wider community for people who are homeless and vulnerable, thereby reducing their isolation and increasing community engagement (298–301). Bespoke arts programmes have been found to support affirmation of identity and empowerment around health and wider issues for people who identify

as LGBTQ (302). Among sex workers, group drumming has been used to build attention, concentration, confidence and motivation to engage in life changes (303).

The arts are being used to help military veterans to engage with health issues, for example through tele-health arts activities for those living in rural areas (304), art appreciation classes for veterans with severe mental illness in recovery centres (305) and choirs to engage veterans in mental health and addiction treatment (306). Dance has also been used to support the rehabilitation of wounded soldiers (307). Children of injured military personnel have also been supported by the provision of creative arts activities, which have been found to improve coping (308).

Within the criminal justice literature, there are many reports on the benefits of the arts in engaging individuals in prisons, in particular those who have refused engagement in other health-related activities (309–311). Programmes have included arts projects for juvenile offenders with complex mental health symptoms or behavioural regulation difficulties, with reported improvements in such difficulties as well as increases in academic performance and family functioning (312,313). Other reported benefits include improved social skills, attention span, stress management, anger management, emotional expression, anxiety, depression, coping skills and self-esteem in young people and adults within forensic settings, with a reduction in rates of reoffending (309–311,314–316). These effects were partly achieved through addressing disadvantage and providing cultural resources to those who might not otherwise have had the opportunity to engage with the arts (309–311). Innovative programmes are also employing people from marginalized groups, such as ex-offenders, to deliver arts activities to other groups, thereby supporting skills development and employment (317).

2.1.4 How the arts help to prevent ill health

2.1.4.1 Well-being

There is a large body of research showing how arts engagement can enhance multidimensional subjective well-being, including affective well-being (positive emotions in our daily lives), evaluative well-being (our life satisfaction) and eudemonic well-being (our sense of meaning, control, autonomy and purpose in our lives). For example, studies of specific arts interventions (including singing, group drumming, arts and crafts, magic, dancing, daily photography and visiting cultural heritage sites) have shown increases in all types of individual and social well-being (190,318–325). These benefits have been found both when individuals volunteer to take part in such activities and when they are referred to activities

by health or social care professionals, for example as part of social prescribing schemes (Case study 3) (327–331). Further studies have also identified benefits for vitality, rejuvenation, resilience, purpose and quality of life (332,333). These responses are likely to occur through effects of arts engagement on modifying cognitions and emotions and building relationships (334). Other studies exploring ubiquitous engagement as part of daily life have found longitudinal associations of well-being across the lifespan with engagement with arts activities and music groups and going to cultural venues (335–338). Notably, well-being benefits of regular engagement with the arts are evident even as early as in pre-school children (339). In adults, the benefits appear to be in terms of both general well-being and occupational well-being in the workplace (340).

Case study 3. Arts on Prescription, England (United Kingdom)

Arts on Prescription has been used for around two decades in the United Kingdom as part of broader social prescribing schemes (329). Individuals who present to their primary care doctor with nonmedical problems (e.g. social isolation or loneliness, which is the case in 20–30% of all visits to doctors in the United Kingdom) or who require additional psychosocial support for their health can be referred to a link worker. Link workers connect patients with community activities, including participatory arts activities. Local evaluations in different regions have shown benefits for mental health, chronic pain, management of complex and long-term conditions, social support and well-being.

Arts on Prescription is most commonly delivered in partnership with local arts organizations and the voluntary and community sector, although some doctors' practices offer their own in-house activities too. Funding for the scheme can come from the Arts Council, local authorities or councils, or from health-care budgets at local levels. Evaluations of the scheme have suggested an average return on investment of £2.30 for every £1 spent; cost-savings occur through reductions in unnecessary prescribing and use of health services including emergency hospital admissions (330).

Work at local levels is supported by the Social Prescribing Network, which has regional representatives to support programmes, and provides resources and support with evaluation (330). NHS England (United Kingdom) has focused on social prescribing as a key component of plans to provide universal personalized care, giving patients choice and control over their mental and physical health care including (for some people) a personal health budget. Further, in 2019, the United Kingdom Government announced funding for

Case study 3 contd

1300 more link workers to help the spread of the programme nationwide and formally included social prescribing with contracts for family doctors.

The aim is to have 4000 link workers in place and to refer 900 000 people to social prescribing schemes by 2023 (331).

2.1.4.2 Mental health

There is also a growing literature on the preventive benefits of arts engagement in relation to mental health. Activities such as making and listening to music, dancing, art and visiting cultural sites are all associated with stress management and prevention, including lower levels of biological stress in daily life and lower daily anxiety (320,341–344). Arts engagement can also help to reduce the risk of developing mental illness such as depression in adolescence and in older age (174,345). Participating in arts activities can build self-esteem, self-acceptance, confidence and self-worth (321,346,347), which all help to protect against mental illness. For example, children and adolescents taking part in social circus arts programmes have improved levels of well-being, socialization and resilience (348), Economic analyses suggest that social circus programmes return US$ 7 for every US$ 1 invested through reductions in the cost of treating illnesses such as anxiety and depression (349). Case study 4 describes community-based support designed for men.

Case study 4. Men's Sheds, Scotland (United Kingdom)

Men's Sheds are community-based places designed to connect men within their communities. Activities at Men's Sheds typically involve woodwork but can also involve gardening, pottery, photography, art and other social activities. Men's Sheds reportedly originated in Australia in the 1970s but have since spread globally, with around 1500 sheds in operation. The impetus was to help to address social isolation in men, including as a result of retirement, the death of a spouse, relocation to a new community or the onset of disability, and to help to reduce age discrimination. Research on Men's Sheds has shown benefits including skills acquisition, social belonging, enhanced well-being, increased self-esteem, a greater sense of self-worth and cognitive stimulation (350,351).

As an example within Europe, Men's Sheds have been running in Scotland (United Kingdom) since 2009. They developed from grass-roots efforts of

Case study 4 contd

individuals in different communities and gradually built up to develop steering committees, business plans and charitable status to support fund-raising.

In 2016, the Scottish Government allocated a start-up grant to support the development of a national Scottish Men's Sheds Association to provide support to individual community groups developing sheds. The association is currently lobbying members of parliament, councillors and Scottish councils for support both financially and in terms of developing supportive policies. Results of social return on investment analyses have shown that for an annual operating expenditure of £5000, Men's Sheds provide a return of £48 844: approximately 10:1 (352). The Scottish Men's Sheds Association provides resources, including roadmaps, for communities who wish to start (353).

2.1.4.3 Cognitive decline

Cultural engagement (e.g. going to the theatre, concerts, museums or exhibitions) contributes to cognitive reserve: the resilience of our brains as we age (354). Individuals who have undergone 10 or more years of musical training have been found to have significantly stronger visual spatial abilities, executive functioning and memory in older age (355–357), with studies identifying specific neurological pathways underlying these effects (358,359). These individuals have also been found to have a lower risk of cognitive decline or dementia (360). Interventions that encourage older adults to play a musical instrument have been found to improve or preserve their general cognition, processing speed and memory (361,362), as well as supporting other aspects of cognition such as reducing age-related hearing loss (363).

Similar results have been found for dance, which has been linked across the lifespan with better learning and memory (364). Dance has been shown to increase hippocampal volume, white matter integrity and levels of neurotrophic factors (biomolecules that support the growth and survival of neurones) and support functional improvements in balance and attention (365). Additionally, theatre interventions both in the community and in retirement homes have been found to improve memory and executive function (366,367), and visual art training has been shown to improve auditory evoked responses to sounds and visual processing (368). Going to museums, galleries, the theatre, concerts or the opera every few months or more often in older age has been associated with a slower rate of cognitive decline and a lower risk of developing dementia (369,370).

For those already experiencing cognitive decline, participating in arts activities such as painting classes can help to prevent it worsening, with results sustained following the intervention (370,371); and creative expressive therapy activities such as drawing with a therapist can improve cognitive functioning, memory, executive function and everyday living ability (372). Dance classes can improve memory, learning and attention (373–375), partly through enhancing motor learning (376).

2.1.4.4 Frailty

The arts can also reduce the risk of becoming frail in older age. Dance simultaneously trains movement, posture and flexibility and has been linked with better balance (377–384) and lumbar bone density before puberty, postmenopause and in women with osteoporosis (385–387). Rhythmic auditory cueing (using music to provide strong rhythmic cues, which is a core feature of dance) has been found to improve and help maintain gait velocity, stride length, cadence and postural coordination (382,388–390). Dance has also been found to improve strength, flexibility, motor ability, aerobic endurance, muscle mass and body composition in older adults (391,392), thereby helping to prevent age-related functional decline. There is some preliminary evidence that dance may help to prevent falls (393), particularly in populations with existing health conditions (394), although other studies have not found benefits (395,396). There is, however, broader evidence that dance can reduce fear of falling in older adults (393,397). In hospitals, engagement with music sessions has been associated with a decreased risk of falls (398). Research into other arts activities has found that engagement with music sessions in hospitals has been associated with a decreased risk of falls (399), while in the community going to the theatre, concerts, museums, galleries and cinema are all linked to a reduced risk of developing frailty and a slower rate of frailty progression in older adults (400).

2.1.4.5 Premature mortality

Leisure activities include participating in arts activities or visiting cultural venues but also a wider range of other activities such as studying, eating out, gardening, having a hobby and religious attendance. Studies focusing on leisure in this widest sense have found protective associations with premature mortality (401–405), as have studies specifically examining arts participation (e.g. playing an instrument and singing) or cultural engagement (especially going to the cinema, concerts, art exhibitions and museums) (190,406,407). Dance of moderate intensity has been identified as an independent risk-reducing factor for CVD mortality among adults aged over 40 years (408). These associations with mortality appear to be

partly explained by socioeconomic factors and partly by the reduction in sedentary behaviours, depression and cognitive decline, all of which are risk factors for premature mortality. These findings link with evolutionary psychology research proposing that arts engagement may confer survival benefits (409,410).

2.1.5 How the arts support caregiving

2.1.5.1 Understanding of health

Understanding health is covered more broadly in literature relating to medical humanities and health humanities (411,412), but it is also related to use of the arts within health to help the understanding of illness and disease. Novels, poems, films, music, drawings, paintings and plays can enhance understanding of the complexity of ill health among clinicians and researchers (e.g. for epilepsy or respiratory illness), help to reduce misunderstanding and support understanding of the cultural contexts of health (413–415). Exhibitions, books, performances and installations can support science communication and encourage new audiences to engage with research on health (416). The role of narrative stories in health is discussed in detail in Health Evidence Network synthesis report 49 on the cultural contexts of health (417).

2.1.5.2 Clinical skills

There is increasing research showing how the arts can improve clinical skills, personal skills and communication among health-care professionals (418). Regarding clinical skills, similarities have been noted in the cognitive processes underlying both music and surgery, with prior musical experience linked with surgical skills (419,420). However, there is contention as to whether music during surgery has benefits or drawbacks, such as reducing communication (420,421). Musical training can improve the administration of cardiopulmonary resuscitation (422,423). Art appreciation classes have been shown to improve the visual diagnostic skills of doctors and nurses (424–426), while aural training improves nurses' recognition of normal or abnormal bowel, heart and lung sounds (424). It has also been suggested that arts workshops could help with the visualization of pathogens as a preliminary step towards enhancing awareness and adherence to infection control behaviours (427). Further, good design of working spaces in hospitals can reduce nursing errors (428).

In relation to communication skills, arts engagement and reading can foster empathetic imagination, thereby supporting effective communication and collaboration between medical staff, as well as attune individuals more with their

own emotions (429,430). Art appreciation classes have been found to improve verbal and nonverbal communication skills in clinical teams (431). Visual arts have been used with elderly patients as a tool for conversation in nursing homes (432), while drawing is reported to support surgeons in communicating surgical plans with patients (433).

The use of theatre formats, including interactive theatre and role play, can also improve communication skills. A course in improvisation has been found to improve listening skills and the ability to respond instinctively and spontaneously for students in medical interviews (434,435). Theatre training/performances can improve case presentations from doctors to clinical teams (436), reduce the use of medical jargon when communicating with patients (437) and support clinicians in breaking bad news (438). Enhanced communication is critical, given that the very tone of voice used by clinicians has been associated with the likelihood of patients initiating malpractice litigation (439). Arts classes have been found to improve emotional recognition, cultivation of empathy and awareness of multiple perspectives in clinicians (440,441), and music and dramatic arts can enhance relatedness to people from different backgrounds (442). Other activities such as drawing by patients have been used to improve doctors' understanding of symptoms such as acute pain (443), while creative writing can support doctors' coherence in the development of care plans for patients (444).

These findings were not confined to doctors but also applied to other health professionals. For example, collaborative arts projects have been found to improve the ability of midwives to provide emotional support to parents who have lost a child in the perinatal period (445). Arts-based pedagogy has been found to improve nursing students' knowledge acquisition, empathy, attitude towards others, emotional state, cognitive and ethical maturity, and level of reflective practice (446). For community health workers, photography and digital storytelling can enhance the understanding of complex health issues (447). For primary care providers, photography can decrease negative stereotypes, reduce the desire to coerce people with mental illness or addiction into treatment, and improve the desire to help (448). Psychodrama sessions for those counselling students have been reported to improve empathy, counselling skills and self-awareness (449). Theatre performances have also been found to improve carers' awareness of their responsibilities and caring duties when looking after somebody with dementia (450).

2.1.5.3 Supporting caregivers

The arts can support mental health and well-being in health-care staff (451). The development of empathy through music and movement has been linked with lower stress and burn-out and higher resilience (452–454). Creative arts classes can enhance confidence, well-being, identity and self-care in both professionals and students (455–459). Music has been found to improve mood and reduce stress while working, as well as improving levels of concentration, efficiency, enthusiasm and ordered working. Participatory arts classes have been found to enhance feelings of support for staff within health-care settings, and visual arts have been found to improve the working environment for staff (460). Stories and diary writing can also support health professionals in meeting the daily emotional challenges of their work (461). Collages and drawing classes have been found to improve interprofessional working and to help identify team issues for doctors and nurses (462,463), while art appreciation classes have been found to improve tolerance with ambiguity (464). Arts activities can reduce exhaustion and death anxiety and increase emotional awareness in those working in end-of-life care (465). For counsellors who have developed secondary post-traumatic stress disorder (PTSD), poetry therapy is associated with a reduction in symptoms (466). Finally, encouraging clinicians to participate in arts activities is also being used as a tool to try and reduce suicide in this group (467).

The well-being benefits of the arts extend to informal carers. Arts programmes can support interactions between carers and those receiving care and can help with humanization of the person being cared for, thereby improving care strategies (468). Relatedly, joint carer–care recipient arts activities have been found to improve communication and carer intimacy behaviours towards a care recipient, leading to closer emotional responses and physical behaviours (469,470). Joint carer–care recipient arts groups can also help to remove strain from caregivers, provide respite care, and give opportunities for emotional support, practical networking and the sharing of resources (471–473), while individual arts and poetry activities can reduce the caregiver's burden and promote self-acceptance, self-awareness, empathy and catharsis (474–476). Arts classes can be used in care settings as a way to understand carers' needs and impart important caring information (475). They can also build a positive sense of personal identity and self-efficacy (472,474,477,478). Finally, activities such as drumming, singing or listening to music have been found to improve relaxation and well-being for carers, and decrease their levels of anxiety and stress (479–482).

2.2 Management and treatment

2.2.1 How the arts help people experiencing mental illness

2.2.1.1 Perinatal mental illness

In pregnancy, arts programmes for mothers and fathers ahead of the birth may help to support their psychological readiness for becoming parents (483). Weekly art therapy in the final trimester has been found to reduce the fear of childbirth, as well as depression and anxiety (484). Listening to music has been found to reduce anxiety during specific procedures such as amniocentesis (485–487), reduce stress in the later stages of pregnancy (488) and improve sleep quality in pregnant women experiencing poor sleep (487). For women with pre-eclampsia, listening to music or receiving music therapy can decrease the maternal blood pressure and increase the fetal heart rate (489,490). Music listening during pregnancy can also reduce the chance of developing low well-being or postnatal depression after giving birth (491), while singing during pregnancy has been associated with greater mother–infant bonding, fewer neonatal crying episodes, less colic and neonatal nightly awakening, and reduced perceived maternal stress (108).

Listening to music during pregnancy has also been associated with a better experience of labour, including reduced anxiety, blood pressure and heart rate; increased basal fetal heart rate; higher fetal reactivity; a shorter first-stage of labour; a greater likelihood of delivery beginning naturally; and a lower need for medication (492–494). During labour, listening to calming music can lower anxiety levels and has also been linked with lower levels of pain (495,496), faster dilation and effacement, faster progression of labour and lower arterial tension (496). Listening to music can increase positive emotions and patient satisfaction and decrease negative emotions and perceived threat for women undergoing a caesarean section (497). It also decreases the associated anxiety (498–500), pain and opioid need (498,500–502), as well as decreasing the heart rate and systolic blood pressure and preventing increases in the diastolic blood pressure and respiratory rate (497). However, there is little evidence of benefit if a woman has a general anaesthetic while the music is played (503). The design of spaces such as the birth room has also been associated with health outcomes, including the number of caesarean sections, maternal pain ratings, satisfaction with care and the ability of staff to perform their duties (504).

Listening to music after giving birth has been associated with fewer symptoms of depression and greater well-being (110), but there is less evidence on benefits

for stress or anxiety (505). A comparison of play, music and movement versus no intervention in women with postnatal depression indicated that the intervention reduced depression, anxiety and stress, and increased self-efficacy and mother–infant interactions (506), while weekly singing was found to reduce the symptoms of postnatal depression faster than either weekly social groups or usual care (507). The favourable comparison with other social groups is important as it suggests that the music itself is important rather than just the social interaction it facilitates. This may be through its beneficial effects for mother–infant bonding, psycho-emotional benefits and the tools that songs provide for mothers in calming their baby (508). For mothers experiencing postpartum psychosis, singing in mother and baby units has also been associated with self-reported improvements in mood (509).

2.2.1.2 Mild–moderate mental illness

Arts engagement, including music therapy and dance, can reduce internalizing symptoms such as anxiety and depression in children and adolescents (510–512). In adults with a mental illness, activities such as choir singing, art-making, expressive writing and group drumming reduces mental distress, depression and anxiety while simultaneously enhancing individual and social well-being (513–522), with similar results for older adults (523,524). Notably, these results were found both when individuals chose to engage in community arts activities themselves and when they were referred to the activities through social prescribing (451,525–527).

Neurobiological theories and research suggest that these benefits may reflect the modulation of neurotransmitters such as serotonin, reductions in stress hormones such as cortisol and decreases in inflammatory immune responses (52,512,514,515,528). Further literature suggests that other aspects of the arts could also contribute, such as emotional aspects (e.g. self-expression, positive mood induction and diversion), social aspects (e.g. mutual engagement with carers and artists, group belonging, social support and improved social functioning), cognitive aspects (e.g. stimulation of memory) and occupational aspects (e.g. structure, learning and self-efficacy) (513,516,517,529–533). Other activities such as group reading, theatre and online social interactions related to music have also been researched, with results suggesting that these activities can enhance self-worth, provide a positive focus for rumination (repetitive thinking), help to change one's view of oneself, support the development of coping mechanisms and provide a support network (534–536).

For people with both acute and chronic sleeping disorders, music has been found to improve sleep quality, sleep efficiency and time to sleep onset, with greater

effectiveness than a range of other interventions. including acupuncture and medication (537–540). Similar results have been found for people with insomnia caused by central nervous system diseases (541). This appears to be due to music inducing a calm mental and physical state conducive to sleep and blocking external and internal stimuli that would otherwise disrupt sleep (542).

2.2.1.3 Severe mental illness

The arts can provide supplementary support to traditional pharmacological and psychological approaches for people with severe mental illness. The majority of research has focused on arts therapies that are led by a trained therapist and combine creative engagement with individual or group-based discussions (543). For example, art and music therapy has been shown to improve global state, general symptoms, negative symptoms, depression, anxiety and functioning in those in the community and within inpatient settings (544–547), with some studies suggesting good cost–effectiveness (548). More specifically, for patients with psychosis, both music therapy and music listening have been reported to improve symptoms of general psychopathology, psychoticism (aggressiveness and interpersonal hostility), paranoid ideation, phobic anxiety, somatization, anxiety and depression, as well as catatonic symptoms such as lack of participation, cooperation, relaxation, interaction and psychosocial functioning (549–551). It is thought that these changes may result from modulation of neurochemical interactions, improved brain function and enhanced neuroplasticity (549,552). However, other studies have not replicated these findings, suggesting a need for further research (553). For patients with major depressive disorder, creative activities such as clay therapy have been found to reduce depression, enhance well-being and reduce alexithymia (lack of emotional awareness) (554), while listening to music has been found to support patients undergoing electroconvulsive therapy (555). Music therapy has been reported to reduce affective symptoms (e.g. hostility, hallucinations and suspiciousness) and negative syndrome symptoms (e.g. emotional withdrawal, poor rapport and difficulty in abstract thinking) in individuals with mild schizophrenia, as well as enhancing social functioning, attention, behaviour and quality of life (556,557), with some similar effects found for dance (341,558) and calligraphy (559). However, large-scale studies of art therapy have not found beneficial effects (560). Reading books and watching films have been identified as protective factors against suicidal ideation (561). The design of inpatient mental health units has also been found to affect mental health, experience and behaviour (562).

Eating disorders have been examined in a number of studies and systematic analyses of case studies from clinical practice (563). Music and art therapy have

been found to support the development of a sense of self and enable insight into the symbolic functions of the illness (564–566), in particular facilitating nonverbal communication (567), body image and social interaction (568), and both control and well-being (563,569). There is also a reported relationship between listening to music for cathartic purposes and emotional eating (570), and music therapy has been found to reduce post-meal anxiety and distress (571). Studies on addiction have reported benefits of music therapy for improving perceived control (572) and reducing cravings (573), although whether there are other benefits such as for motivation or coping skills remains unclear (572,574). Further evidence has suggested that group music activities such as choirs can enhance social connections and provide positive diversion for people overcoming addiction (306), while museum outreach activities could enhance pride, social capital, independence and resilience (575). Research into obsessive–compulsive disorder has suggested that music listening can reduce symptom severity for both obsessions and compulsions and could enhance the effects of pharmacotherapy and cognitive behavioural therapy (576,577). Other research into social anxiety disorder has found reductions in the time spent dwelling on threats as a result of music listening (578), and reductions in social anxiety as a result of participation in improvisation theatre workshops (579). There is also preliminary research on the potential benefits of the arts for other conditions such as personality disorders (580).

2.2.1.4 Trauma and abuse

Among children who have experienced trauma (including sexual abuse, terrorism, war and domestic violence), studies have shown promising findings for the value of the arts in supporting grief, depression and PTSD, as well as for the communication of experiences (581,582). For example, children who survived the 2008 China earthquakes and were given 30 days of calligraphy training had greater decreases in hyperarousal symptoms and stress hormones (583). Children who were given access to arts resources and encouraged to draw during investigations into alleged abuse provided clearer forensic statements and were also more likely to report feelings of hope and success following the investigation (584,585). Art therapy may help to reduce anxiety in adults who have experienced trauma, as well as potentially lessening the impact of an event and reducing avoidance, re-experiencing and arousal (586). For societies as a whole, the arts have been proposed as powerful tools for community building and post-disaster development, as demonstrated in community arts projects such as in Sri Lanka following civil war and the tsunami (587).

In both child and adult refugees and asylum seekers, creative arts activities have been found to decrease anxiety, depression, post-traumatic stress and peer problems (588). Multicultural arts can support the preservation of personal identity, heritage and experience, which are all important factors within well-being (589). In this way, the arts can help to reduce feelings of powerlessness, humiliation and anger (common issues in forced migration) and promote social inclusion, mental health, social acceptance and belonging (583,590,591). In refugee camps, the arts can support the preservation of religious identity through the celebration of festivals and events, help to alleviate psychosocial distress and trauma, and reduce stigmatization (581). Research looking at the lasting impact of trauma, for example after 70 years in Holocaust survivors, has found higher levels of resilience among those who have engaged in the arts over the course of their lives relative to those who had not (592), suggesting the value of the arts both in the immediate aftermath of trauma and in the decades that follow.

There is also a growing literature relating to the arts and post-traumatic stress. In intensive care units, diaries written by staff and provided to patients after discharge have been shown to reduce the incidence of PTSD (593). Preliminary research suggests that music can reduce the symptoms of PTSD in adults through reducing anxiety and depressive symptoms, increasing pleasure, helping with emotion regulation and supporting the building of communities and support networks, thereby fostering resilience, reducing stigma and improving functioning (594–597). Dance can also help people with PTSD to build a healthy relationship with their body, including helping to counteract body armouring (muscle tensions in response to stress), reducing perceived stress and increasing movement (which can become limited and stiff following trauma) (598–600). Use of binaural beats (pure tones played simultaneously that interfere with one another and encourage brainwave entrainment) has also been shown to help in managing cardiovascular reactivity in military personnel with post-deployment stress (601), while broader arts programmes have been used alongside psychiatric and cognitive behavioural approaches to address PTSD (602). Drawing can reduce depressive symptoms, anxiety and PTSD symptoms and may also reduce the overall effects of the traumatic event, negative affect and pain, as well as improving understanding and meaning-making of the event (603).

2.2.2 How the arts support care for people with acute conditions

2.2.2.1 Premature infants

In neonatal intensive care units, allowing infants born prematurely to listen to music has benefits for heart rate, respiration rate, oxygen saturation, sucking/feeding ability and behavioural state, as well as being linked with overall reductions in length of stay in intensive care (604–607). Exploratory studies have also found reductions in inconsolable crying (608), the number of negative critical events (609) and regulation of salivary cortisol levels (113). Notably, early music listening in neonatal intensive care units has been found to have longer-term benefits, reducing fear reactivity and anger reactivity at 12 and 24 months later (610). Reading to premature infants has been found to reduce oxygen desaturation, suggesting the importance of the voice in calming infant anxiety (611). For mothers in the neonatal intensive care units, listening to music can reduce stress and anxiety and increase breast-milk expression, in particular the production of milk with a higher fat content (113,612–614).

2.2.2.2 Inpatient care

The design of emergency departments to include artwork and colour has been shown to reduce aggressive behaviours towards staff (615). Arts activities in emergency settings, including music, crafts and clowning, have been found to reduce anxiety, pain and blood pressure (616,617), particularly among children but also for their parents (618). Broader studies of music interventions and pain have found significant reductions in acute, procedural and chronic pain; distress from pain; intake of anaesthetics; and the requirement for opioid and non-opioid pain medication (619).

The provision of arts activities, live music and theatre performances by patients' bedsides has been found to reduce anxiety and pain and improve mood and compliance with medical procedures in both children (Case study 5) and adults (621–623), while group activities on hospital wards such as drumming circles for children and families have been found to improve affect (624). Play therapy incorporating creative activities such as storytelling, colouring and pictures can reduce anxiety as much as preoperative medication (625), improve patients' communication with staff (626), reduce negative feelings (627) and improve patients' satisfaction with nursing care (628). Artwork in hospitals can also reduce stress for children and adults, including through providing familiarity, distraction and prompts for social engagement (629). Hospital arts programmes have been

found to predict patient satisfaction and the likelihood that patients recommend a hospital to others (630,631), with pleasant natural sounds such as birds and calm music contributing to levels of attention from both patients and staff (632). Further aspects of the design and architecture of health-care spaces are discussed in more depth elsewhere (633–636).

Case study 5. Doctor Clown, Russian Federation

Doctor Clown was established as an autonomous non-profit-making organization in 2010 to improve the experience of children in orphanages, hospices and hospitals in the Russian Federation. Doctor Clown aims to help children and their families to cope with stressful situations; to combat the fear of examinations and procedures and distract children during painful procedures (e.g. dressing burns), thus supporting the work of clinicians; and to improve trust in doctors and other medical staff for both children and their families. Within hospitals, the programme is often delivered in cancer units, surgical wards, burns departments, intensive care and emergency departments, where the high intensity of these departments can lead to high levels of stress. Although termed clowns, their activities involved a broad creative activities from magic tricks to puppetry and live music.

The programme started as a three-month pilot partnership with one hospital, the Republican Children's Clinical Hospital, in Kazan, the capital of the Republic of Tatarstan. It has since grown to cover five regions of the Russian Federation, employing more than 50 people. The programme works in partnership with creative universities, selecting students and graduates on a competitive basis for inclusion in a training course. This course incorporates skills in improvisation and work with children, instructions on various diseases and their treatment, and the basics of psychology. Graduates then work in shifts once or twice a week. More information can be found in a report of the programme (620).

2.2.2.3 Surgery and invasive procedures

Multiple large-scale meta-analyses and systematic reviews have shown benefits of recorded music in surgical settings. Music has been found to reduce heart rate and blood pressure preoperatively (637), with suggestions that it has greater efficacy than anxiety medication (638). Postoperatively, music has been shown to decrease anxiety, pain and analgesic use (639,640). Such benefits have been found in children for both surgery and broader medical procedures (641,642),

and in adults for invasive procedures such as biopsies, cardiac catheterization, urological procedures and treatment of burns (643–646). The use of music before or during hospital procedures has been found to improve patient satisfaction and willingness to repeat the procedure (642–645,647). Some exploratory studies have also found further changes in respiratory rate, skin temperature, systolic blood pressure, salivary cortisol (648–650) and glucose (651), with reduced length of stay (639) and improved mood, cognitive function and patient satisfaction in older patients (637). Although a smaller literature, similar benefits for preoperative anxiety (particularly in children) have been noted from other activities, including digital storytelling (652), picture books (653,654), art therapy and clown visits (655), tablet apps (654–661), and ceiling art in treatment and test rooms (662).

In addition, there is also a growing literature suggesting that arts activities such as arts therapy can support psychological adaptation to surgical procedures. For example, digital arts interventions have been shown to improve mental health and time to discharge in patients following major procedures such as bone marrow transplants (663), while art therapy has been found to improve depression and anxiety and enhance emotional competence in patients undergoing maxillofacial surgery, neurosurgery or reconstructive surgery (664–666).

Following surgical and invasive procedures, the arts can support rehabilitation. Listening to music during physiotherapy following knee replacement led to an increased range of motion and continuous passive motion (667) and reduced perceived fatigue and exertion (668). For patients who have had upper-limb prosthetics fitted, rhythm-based games improved fine muscle activation and motor movements (669). Music accompanying other therapies such as robot-assisted therapy also increased levels of interest and enjoyment in rehabilitation (670). Following rehabilitation, community creative activities such as woodwork groups have been found to improve quality of life, skill development and socialization (671). For people experiencing chronic pain or fibromyalgia, following either surgery or injury, dance programmes of 12–24 weeks in duration were found to reduce pain and improve quality of life, depression and physical function (672). Arts workshops have also been found to support the communication of pain (673).

2.2.2.4 Intensive care

Anxiety, heart rate, blood pressure and respiratory rate can be reduced by listening to music in patients who are mechanically ventilated (674–677) and can improve daily weaning for patients on prolonged mechanical ventilation (678), thus reducing the time spent on a ventilator and shortening the length of stay in intensive care (679).

Music can also reduce the need for sedatives (675) and help to reduce spikes in cortisol levels, as well as decreasing levels of adrenaline and inflammatory markers (680,681). Music helps to reduce pain and maintain the sedation level as patients undergo ventilation procedures such as endotracheal suctioning (682). The use of music in intensive care has been linked to better sleep while being mechanically ventilated (683) and lower levels of traumatic distress at time of discharge (684). It has also received high patient satisfaction ratings and support from nursing staff (675,683). An arts-based intervention has also been used for patients who have to remain for some period in an isolation ward (Case study 6). Some patients in comas who listen to music show improvements in behaviour, such as increased eye movements or smiling, and reduced inertia or psychomotor agitation (686,687). Some studies have also found improvements in oxygen saturation, changes in blood pressure and heart rate, and increases in brain activity (686,687).

Case study 6. OpenWindow, Ireland

OpenWindow was a five-year arts-based intervention that provided a virtual window for patients undergoing bone marrow transplants for leukaemia in isolation wards at St James Hospital in Dublin, Ireland (685). The programme aimed to reduce stress in these patients, who spend extended periods of time in isolation following the transplant. The idea of the project was to create patient-centred artwork to alleviate feelings of disconnection from the outside world, improve the patient experience and help patients to cope with illness, without infringing on hospital and infection protocols.

Patients were heavily involved in the design and development of the programme. They were supported by a team of artists in partnership with clinical staff. Each room was provided with its own digital window projected onto the wall of the room, which showed nine channels with different images and videos. The patient was given control over selecting which channel and controlling the sounds and music played through speakers in the room. The content included familiar items such as photographs chosen by the patient and family, audiovisual artworks with themes such as nature created by artists and inspired by patients, and video streams of cameras placed in locations that were significant to the patient. All of the content was carefully assessed to make sure that nothing would induce a negative reaction, and a psychiatrist and psychologist were available to patients if needed.

Case study 6 contd

Patients provided with OpenWindow were found to have lower levels of anxiety and depression the day before the transplant, and at both seven days and 60 days after the transplant. OpenWindow was also found to improve the transplant experience, reduce isolation and provide a connection with the outside world.

2.2.3 How the arts help to support people with neurodevelopmental and neurological disorders

2.2.3.1 Autism

There is a wide literature demonstrating that some individuals with ASD can excel at creative activities, including having superior memory for pitch and timbre, excellent broader musical memory and high levels of ability to process melodic and rhythmic complexity (688). Even among those without such skills, the arts have been shown to have profound benefits. Music and art therapy can improve communication, including social interaction skills, sensory perception and language in some children with ASD (689–692). It has been proposed that music is particularly effective for communication as it forms a proxy language, encoding both metaphor and linguistic structures (693), while art-making allows the use of symbols as well as coupling of the artwork with body language for expression (691). Music and arts can, therefore, play a pivotal role in socialization and communication for young children with ASD (694). Studies have shown that auditory–motor rhythmic training through music can facilitate and improve language processing and acquisition and speech control (688). This may be partly because the mechanisms of speech and song have functional and structural differences, with music abilities more frequently preserved in children with ASD (695,696). Relatedly, rhythmic–motor components in music have also been found to improve motor control, including gross and fine motor skills, which can be impaired in children with ASD (695,697). One study has even suggested that antenatal music training and maternal talk can reduce the risk of children developing autistic-like behaviours (698), although more research is needed here.

In addition, although individuals with ASD commonly have significant deficits in processing complex emotional cues within their social context, the ability to identify the emotional content of complex nonsocial stimuli, such as music, is generally preserved (688). Indeed, studies have found that music and art can help in the expression, recognition, understanding and processing of emotions in

children with ASD (699). Music has also been found to improve mood (689,690) and biological markers of stress (700). Both music and theatre activities can reduce anxiety (701,702), partly through improving sociability and through providing stability and self-soothing when experiencing new situations (699). Art has been found to improve self-esteem and sense of self, as well as confidence (691). Participation in the arts can also reduce victimization of children with ASD, and improve prosocial emotions from other children (703).

Music has additionally been found to improve behaviours (689,690). For example, music can lead to fewer instances of repetitive behaviours and can increase attention to tasks and the following of directions (699). It can also lead to more responsive social behaviours, including eye contact (704). Art can support learning skills, leading to greater coping with new information, the enhancement of symbolic thinking and the development of imagination (691). Role play and modelling through theatre has also been found to support the social engagement of children with ASD (705,706). Further, preliminary evidence suggests music may help to increase exercise intensity in children with ASD (707).

2.2.3.2 Cerebral palsy

Arts activities have been found to improve social skills and participation in children and adolescents with cerebral palsy (708,709). Music therapy improved attention and communication, as well as brain plasticity (710). Rhythmic auditory cueing improved gait velocity, cadence and stride length in children and adults (711), and music during exercise improved the strength and power of knee joints (712). Dance has been found to improve self-care, communication, cognitive function, psychosocial adjustment and overall functioning, as well as balance, standing ability, gait, walking and cardiorespiratory fitness (713). Dance also improved postural control in children with cerebral palsy and helped with emotional expression, social participation and attitudinal change (714,715). Parents also have reported enjoyment and therapeutic benefits for their children from dance (716). There are promising preliminary studies on wheelchair dance for children with severe cerebral palsy (717).

Regarding upper limbs, piano training has been found to improve feelings in fingers (718,719) and improve arm and hand positioning (720), possibly through triggering neuroplastic processes necessary for the development of sensorimotor skills in the upper limbs (719). Auditory stimulation has been shown to improve upper extremity skills (721). Additionally, magic tricks improved hand function in children with hemiplegia (paralysis affecting one side of the body; Case study 7) (723,724).

Case study 7. Breathe Magic, England (United Kingdom)

Breathe Magic intensive therapy is a programme that aims to improve hand function in children with hemiplegia. The programme was designed by occupational therapists, neuroscientists and Magic Circle magicians to incorporate traditional hand therapy exercises into magic tricks (722). As part of a 12-day summer magic camp and follow-up workshops, young people with hemiplegia aged 7–19 years undertake 78 hours of one-to-one intensive therapy in a group setting, learning not just how to do the magic trick but how to be a magician, including speaking confidently, making eye contact and holding an audience's attention. The programme, therefore, addresses both the physical and psychosocial challenges faced by young people with hemiplegia.

Breathe Magic is built on a medical model called the hand arm bimanual intensive therapy programme, which has been researched in its own right. Other research has shown clinically significant improvements in bimanual motor skills and independence following the programme; reported improvements in psychological well-being, communication skills, self-esteem and parent–child relationships; and shown a reduction in the hours of care and support needed by each child. The programme has been shown to be comparable in terms of cost with other treatments such as botulinum toxin injections. The combined psychosocial and physiological approach supports mental health and encourages independence among young people with hemiplegia; it also helps them to engage more and contribute to society, with wider potential economic gains.

Young people with hemiplegia can be referred by their parents to the programme or can receive fully funded places through local National Health Service clinical commissioning groups in the United Kingdom. The Breathe Magic team undertake full clinical assessments of each child on entry to the programme and periodically across the following six months, providing clinical reports to the child's family, doctors and school. Since its inception in 2008, the programme has run in the United Kingdom (England and Wales) and in Australia.

2.2.3.3 Stroke

Listening to music has been found to help the development of new neural pathways following a stroke and to enhance structural neuroplasticity (725–728). These benefits have been accompanied by improvements in the recovery of verbal memory and focused attention, reductions in confusion and depression, and enhancement of positive mood, relaxation and motor activity (728,729). Music therapy improved

mental health and well-being (730,731), with art participation improving depression, quality of life, self-efficacy and adherence to treatment (732–734). Group singing for stroke survivors can improve mood, confidence, motivation and social support (735,736). The benefits of the arts for recovery from stroke could be linked to the cognitive challenge posed by arts engagement, the emotional and psychological responses, and (where activities are social) the development of social support networks (737,738).

For motor rehabilitation after stroke, music-supported therapy and dance have been found to improve upper- and lower-limb motor function, muscular weakness, balance, gait velocity, cadence, grip strength and stride length (730,739–742). Some studies have also shown improvements in executive function and memory (731,743). As in physical rehabilitation following surgery (section 2.2.2.3), the coupling of auditory and motor systems and the ability of music to modulate mood and arousal appear key to these results (744).

Some studies suggest that people with aphasia (language disorder) following stroke have better singing versus speaking ability, although the literature is mixed (745,746). There is more consistent evidence that repeating words is easier when they are sung rather than spoken (747), through a combination of slowing production rate, using melody as a retrieval cue and increasing connectedness between syllables and words (134). For people with Broca's aphasia (impaired speech but preserved comprehension), singing can help speech, naming and repetition (748,749), as well as increasing activation and neural processing efficiency in the brain (750,751). Music can also help with dysarthria (unclear speech articulation), another common motor speech disorder following stroke, including supporting intonation, rhythm and intelligibility (752,753). Further arts activities such as photography have also been found to support aphasia by providing alternative means of communication (754).

2.2.3.4 Other acquired brain injuries

Music-making involves the simultaneous processing of visual, auditory, sensory and motor information and, consequently, has been explored in a number of studies relating to acquired brain injuries, through accident or illness (134). There are widely reported benefits of music-making for mental health, well-being and mood for those with an acquired brain injury (755,756). Additionally, song-writing can improve self-concept and well-being in hospital rehabilitation, as well as developing a sense of hope and coping strategies (757–759). Arts activities improved communication skills, social participation and goal-setting in adolescents and children with acquired brain injuries and improved social skills and social participation in adolescents

with brain disorder (708,760). Narrative storytelling has also been reported to help patients to express emotions and share their experiences for awareness-raising (761).

For individuals in wheelchairs following spinal cord injuries, dance improved the range of motion, upper body strength and coordination, as well as decreasing weight, resting pain and reaction time (762). Similarly, arts activities such as painting, woodworking and clay modelling have been found to improve well-being, general health and vitality in addition to reducing depressed mood (763,764). For young adults with physical disabilities, social circus programmes that involved developing skills in circus activities (e.g. juggling and trapeze) alongside performing arts (e.g. dance, percussion and music) have been reported to enhance communication, mobility, interpersonal relationships and community life (765). For patients with quadriplegia, singing can improve projected speech intensity and phonation length, as well as mood, with results maintained at six-month follow-up (766). For patients with blast injuries, music therapy supported breathing, strength endurance, range of motion, task attention, articulation, social integration, quality of life and motivation (767). Listening to music reduced agitation in patients with cognitive impairment following traumatic brain injury (768), while art therapy supported coping and acceptance (769). Finally, for individuals with epilepsy (whether as a result of brain injury or otherwise), several studies have indicated that calm music may reduce the frequency of seizures (770–772).

2.2.3.5 Degenerative neurological disorders

Dance has repeatedly been found to provide clinically meaningful improvements in motor scores for people with Parkinson's disease (PD) (773–775). Dance involves basal ganglia structures, activating similar neurological pathways to regular exercise, and also supports the psychological state by enhancing the concentration of serotonin (776). Improvements have been found in balance, gait speed and functional mobility (774,777–779). When directly compared with exercise interventions, dance appeared to have stronger effects on balance but not on other functional outcomes (780). However, dance studies involving people with PD have also typically shown high compliance rates, low dropout and continued activity beyond the study period (780). Relatedly, rhythmic auditory cueing with music also appeared to benefit gait and stride length (781) and reduced the risk of falls (394). Self-generated singing also appeared to be a good cueing technique for walking (782).

Similarly, music and dance have been found to improve gait velocity, stride length, balance, smoothness of motion and number of steps per minute for those with multiple sclerosis (783–787). Keyboard playing has been found to improve hand

function, strength and dexterity in people with multiple sclerosis (788) and movement to music has been found to improve sleep (789). There is also promising preliminary research in those with Huntington's disease that dancing reduces the rate of motor impairment (789,790). For patients with motor neurone disease, preliminary research has suggested that music-assisted relaxation could support the transition to noninvasive ventilation (791).

The arts can also support improvements in non-motor impairments in people with degenerative neurological disorders. Even when speech is affected by neurological conditions, singing can remain unimpaired (792). Singing can help to reduce the symptoms of weak or hoarse voice in people with PD, and reduce imprecise articulation or impaired stress or rhythm in speech (793–798). Preliminary research has also shown the benefits of singing for swallowing in people with PD (799). Further research has shown benefits for mental health and quality of life. For example, singing has been found to improve quality of life and reduce depression in people with PD (798); music therapy has been found to improve quality of life in people with motor neurone disease (800); and dance has been found to improve quality of life and decrease isolation in people with PD (Case study 8) (801–803).

Case study 8. Dance for PD programmes, Europe-wide

There are estimated to be over 300 communities offering dance for PD programmes globally, united through the Dance for PD network (802). Dance for PD was founded in 2001 to address creatively the symptom-specific concerns of people with PD such as balance, cognition, motor skill, mental health and physical confidence. Programmes are led by professionally trained dancers, who draw on their movement expertise, and the programme is supported by an advisory board comprising neuroscientists, neurologists, health-care professionals and researchers. Dance for PD provides training, resources and catalogues of many of the active programmes. To date, over 40 clinical studies have assessed the effectiveness of the dance programmes.

Within the WHO European Region, a number of Member States offer classes, including the programmes Care to Dance and Dance for Health (Netherlands), Dançar com Pk (Portugal), Dance Well/CSC Bassano (Italy), DaPoPa (France), Dutch National Ballet/Creative Wellness Foundation (the Netherlands), English National Ballet and Musical Moving (England, United Kingdom), Kinesiphila (Belgium), Scottish Ballet (Scotland, United Kingdom), Skånes Dansteater (Sweden) and Step Up for Parkinson's (Malta) (803). The majority of these are led by dance organizations that have developed relationships with doctors in

Case study 8 contd

primary care, hospitals or with specialist PD treatment centres. Some provide direct referrals and participants can also self-refer.

2.2.3.6 Dementia

Music, in particular, has been found to support cognition in people with dementia. It may be particularly suitable because for certain types of dementia, such as Alzheimer's disease, because brain areas underlying musical memory can be relatively well preserved even in later stages of the disease (804). A number of studies have found beneficial effects of listening to and making music for global cognition as well as for verbal fluency, visuospatial skills and speech (805–807). However, most consistent results have been found for autobiographical memory (808), probably because the processing of music-induced emotions and aspects of cognition are colocalized in the brain (809). Singing, in particular, has been found to improve a wide range of cognitive skills including attention, episodic memory and executive function (810). Preliminary studies have also suggested other benefits from the arts: dance may support speech, as well as speech-related cognition (811); literature activities (e.g. group reading or storytelling) may enhance memory, listening, attention, communication of basic needs and conversation skills (812); and visual arts may lead to higher sustained attention than many other activities (812). Dance movement therapy and music have also been found to support embodied nonverbal communication (813,814), even when language deteriorates (815).

In relation to the social aspects of dementia, arts activities have been found to have benefits for some of these, such as social isolation, unwelcome behaviours and poor communications. Music and dance help to reduce social isolation and loneliness for individuals with dementia, partly through providing a sense of security and belonging (813,816). The provision of arts activities in nursing homes and their encouragement within communities has been found to increase socialization and positive social behaviours (817,818) and drama activities improved communication between patients and carers (819). Group knitting can support the maintenance of social skills (820). Other arts activities, such as pottery, dance, shared reading and visual arts education, can also help to affirm identity, sense of self, and self-esteem for individuals with dementia (813,814,821–824). This affirmation, particularly in the face of a diagnostic label, has been linked with strong autobiographical memories and reminiscence (813). The architectural design of residential spaces has also been found to affect social dynamics and social interaction in older adults (825).

In relation to mental health in dementia, many studies have found benefits of music and dance for reducing anxiety (including stress hormones) and also some evidence of their benefits for depression, particularly if individuals engage regularly over long periods of time (e.g. three months or more) (805,816,817,826–828). These results may reflect the immersive nature of music, which can lead to enhanced mindfulness and fewer intrusive thoughts (813). Music has been found to enhance the effects of reminiscence therapies on stress, anxiety and depression (829). The arts have also been found to reduce apathy and improve well-being and quality of life (171,177). Long-term group music has also been found to reduce increases in blood pressure and support the maintenance of physical health (830).

Relatedly, active engagement with music and music listening have been found to reduce agitation (e.g. repetitive acts, wandering, restlessness and aggressive behaviours) and behavioural problems in people with dementia (805,826,827,831,832). Notably, these results have been found for many types of dementia, including Alzheimer's disease (827). Arts and drama classes have also been found to reduce aggression, agitation and behavioural problems both across individual sessions and longitudinally (833). In care homes, background music has been shown to reduce agitation during mealtimes and improve cooperation during bathing (834,835). Other studies have examined how the design of hospitals and care homes (including the use of contrasting colours and lighting) can improve behaviour, cognition and well-being (184).

The arts also have a positive effect on physical health and functioning. For people with dementia who have been hospitalized, music has been associated with a reduction in the average length of stay, an increase in discharges, a reduction in falls and a decrease in the need for antipsychotic drugs (836). For individuals with moderate and advanced dementia, music is associated with lower levels of congestive heart failure, lower inflammation levels and lower stress hormones (837). Multisensory arts activities have been found to increase individuals' abilities to carry out activities of daily living (838).

2.2.4 How the arts assist with management of noncommunicable diseases

2.2.4.1 Cancer

During treatment for cancer, activities such as listening to music or participating in an art-making session have been found to have benefits for both children and adults, including by reducing adverse side-effects such as drowsiness, lack of

appetite, shortness of breath and nausea (839,840); reducing anxiety and distress (841–843); reducing the need for antiemetics (anti-sickness medication) (844); reducing fatigue (845) and feelings of depression (846); and enhancing feelings of energy and vitality (847,848). A large number of studies have also shown benefits from regular art-making activities and dance for pain reduction in general (849–852) and during treatments such as chemotherapy and stem cell transplantation (844). The provision of arts activities within hospitals, such as regular live concerts, recorded music or recorded audio poetry, can also reduce anxiety and depression and promote hope for patients with cancer (853,854). Dancing, arts and crafts, and storytelling can also support patients and their relatives with strategies to manage cancer-related concerns that they can apply afterwards in their daily lives (855). Music listening has also been reported to reduce the length of hospital stay following surgery for cancer (856), which is similar to results from studies of other surgical and invasive procedures (section 2.2.2.3).

Outside of treatment sessions, there are also benefits from regular participation in the arts. Music activities, art therapy, poetry therapy and dance have been found to help with the management of mental health in patients with cancer, including by reducing stress, anxiety and depression and improving quality of life (848–850,857–865). These positive effects on psychological factors are accompanied by physiological changes, including decreases in blood pressure and heart rate, decreases in stress hormones, increases in immune activity and reductions in inflammation (50,857,866). Broader art appreciation classes have also been found to reduce anxiety and depression scores (867). These benefits may be facilitated by the role of the arts in providing diversion, pleasure, a sense of control and increased resilience, self-realization, and opportunities for learning and enhanced social relationships (841,866–871). Indeed, studies have noted particular benefits from regular classes in terms of self-image, identity, self-esteem, trust, consciousness and fear reduction, in both children and adults with cancer (848,849,872,873).

Among both adults and children, the arts have been found to aid emotional expression (839), improve coping and psychological adaptation to cancer (839,871,874,875), and enhance optimism and hope for survival (876). Arts activities have been found to enhance communication with health-care staff and promote collaborative behaviours (864,872,877). For example, drawings have been used to help health-care professionals identify symptoms being experienced by young children (878,879) and photographs have been used to provide patient and caregiver perspectives on sources of distress during diagnosis and treatment (880). Similarly, creative writing or blogging from adults with cancer is reported to be both a cathartic process and

increase professional awareness of what additional support or provision might be needed (881,882). Nonlinguistic communication via art-making has been found to foster understanding among health professionals of the lived experience of cancer (883). Arts activities can also provide a variety of support for cancer survivors, including by increasing relaxation and reducing fatigue (884), fostering reflection on cancer diagnosis (885), improving the relationship with one's body (886) and supporting the construct of new narratives (885).

2.2.4.2 Respiratory disease

Singing has a number of similarities to physiotherapy and the breathing techniques used for breathlessness management and airway clearance (887,888). Singing has been found to improve physiological measures (e.g. the strength of respiratory muscles, oxygen saturation, inspiration capacity) and support mental health (e.g. reducing anxiety, improving agency and self-efficacy, and improving perceived breath control) (887,889,890). Singing has also been linked with a decrease in visits to the doctor and hospital admissions (887). Studies have consistently identified themes of improved well-being, social support, mutuality and connection for participants (887,891), as well as highlighting the importance of the safe space provided by singing groups through the presence of others with similar health conditions and the sense of ease provided by sharing the activity of singing (887). Benefits of the singing groups have been found to extend to patients' wider lives, including increasing individuals' sense of purpose and personal growth and enhancing the desire to learn new skills (887).

As well as singing, listening to music improved exercise capacity in people with chronic obstructive pulmonary disease and also helped individuals to manage breathlessness while exercising (892–898). It also reduced anxiety and improved longer-term quality of life (892,893). Similar results have been found for patients with cystic fibrosis, for whom both singing and listening to music have been found to have benefits for lung function (899,900). Music listening also helped to calm anxiety and breathlessness (901) and has been shown to be more effective than progressive muscle relaxation in reducing anxiety, blood pressure, respiratory rate and breathlessness among patients with chronic obstructive pulmonary disease in hospital following a flare up of symptoms (902). Regular music therapy also helped with management of the anxiety, depression and fatigue that is often associated with the condition (903,904). Studies asking patients to draw their lungs have found that this can highlight any discrepancies between patients' stage of disease and their understanding of their disease (905).

Among other pulmonary conditions, there is preliminary evidence that playing a wind or brass instrument may support asthma management (906), and music therapy can help to improve respiration rate and oxygen saturation (907). Didgeridoo lessons in schools have helped to improve asthma awareness and compliance with asthma management plans (908), and drawing classes have contributed to emotion regulation and the development of self-management practices (909). Additionally, music tracks interspersed with health messages improved asthma knowledge in adolescents (910).

2.2.4.3 Diabetes

Listening to music has been found to help control blood glucose (sugar) levels and glycated haemoglobin (indicative of the glucose level in the bloodstream over time) during ordinary and stressful situations in both those with diabetes and those without (911,912). Hypertension (high blood pressure) increases the risk of serious health problems and a number of studies have shown improvement in blood pressure and blood glucose levels through arts activities: music therapy sessions reduced blood pressure (913); dance improved control of blood glucose levels and blood pressure and also provided peer support for coping with lifestyle changes following diagnosis (197); and creative arts activities were shown to support emotion regulation and meaning-making in individuals with diabetes (914,915).

2.2.4.4 CVD

Listening to music and dancing have been found to reduce heart rate, blood pressure and hypertension in individuals with CVD, with dance additionally improving exercise capacity (916–919). Research has suggested that making music can alter gene expression linked with stress and immune function (920) and it has been proposed that music is beneficial for relaxation in CVD through its simultaneous effects on psychological, neurological, immunological and endocrine processes, leading to reduced stress and pain and better coping (921,922). Music has also been reported to decrease aortic stiffness (a risk factor for CVD) (923).

Waltzing was found to be as effective as aerobic exercise for improving functional capacity in patients with chronic heart failure (924), while listening to music increased total walking distance in patients with claudication due to peripheral artery disease (925). Listening to music during physical activity has been shown to increase the volume of activity in patients undergoing cardiac rehabilitation, with synchronization of tempo and exercise pace, in particular, helping individuals to exercise more regularly and for longer (926). The arts can also support mental

health in people with CVD. Art therapy has been found to improve depression, anxiety and anger in such patients (927), while listening to music reduced psychological distress, with some suggestions that it could also reduce anxiety in patients with myocardial infarction, reduce pain and improve quality of sleep (928).

2.2.5 How the arts support end-of-life care

2.2.5.1 Palliative care

The arts can also be supportive in palliative or end-of-life care, in particular by providing psychological and physical support, opportunities for communication and emotional expression, cognitive reframing of the illness experience and enhanced social interaction and sense of community (928). The arts (particularly arts therapies) are associated with lower levels of sadness, anxiety and depression, and higher well-being, emotional function and quality of life (929–932). Arts activities also provide opportunities for developing a community within a palliative care setting and improving relationships and communication with family members (933–935). Arts engagement has been associated with greater spiritual satisfaction (932,936), including through providing existential comfort and meaning (937,938) and helping with courage, strength and saying goodbye (939). Music and art therapy have been associated with the provision of physical support, for example greater relaxation (930), new self-awareness and purpose (939), regulated heart rate (932), less agitation (940), lower distress (929), fewer physical symptoms (941), lower pain scores (931,939,942) and marginally less trouble breathing (936,939,943). Dance can help with coping with pain (944) and in supporting people with terminal illness to feel connected with their bodies and have a sense of self (944). A further body of literature also demonstrated associations between arts participation and lower fatigue (929,930,939). The arts have also been used to improve the environment of end-of-life care, with patient-produced photographs highlighting how surroundings support or hinder feelings of connection, identity and value (945).

2.2.5.2 Bereavement

The arts are a traditional way of supporting bereavement. For example, the creation of community artworks such as the United States' AIDS Memorial Quilt (which contains thousands of panels representing individuals who died from AIDS) can give expression to community grief, while gravestones engraved with poems, song lyrics and images can be used to facilitate memories and provide a focal point for mourning. Singing and dancing are common funeral activities across different cultures (946). Bereavement photography has been found to support the

preservation of memories for parents who have lost a child in the perinatal period (947), while artwork created by parents and children as a way of building a shared legacy prior to the death of a child has been associated with fewer symptoms of prolonged grief (948). Studies have also shown that arts and music activities for families following bereavement can help with loss and support coping (949), support the maintenance of stable mental health (950), help in the development of support networks (951), facilitate the continuation of bonds with the deceased (952), enhance meaning-making (952), reduce sadness (953) and support staff in providing empathetic and compassionate care (954).

3. DISCUSSION

3.1 Strengths and limitations of the review

This review has several strengths. First, it considered the worldwide literature on the links between the arts and health, focusing in particular on meta-analyses, meta-syntheses and systematic reviews, as well as referring to findings from a range of individual studies. In order to capture the available and relevant literature, the search was conducted in English and Russian, two key languages in the WHO European Region. Secondly, it considered the role of the arts not just in relation to specific health conditions but also in relation to prevention, promotion and broader determinants of health. Thirdly, it valued data from a range of methodological approaches, using triangulation to explore common findings.

Nevertheless, several limitations remain. First, this report did not involve a systematic literature search, as this would have produced too many results for an effective synthesis. However, it did prioritize results from over 200 previous systematic reviews, quantitative meta-analyses and qualitative meta-syntheses that had included systematic searches, and it also involved in-depth searches of multiple databases to identify further studies for inclusion: over 3000 studies in total. Consequently, this report is the most comprehensive survey of the literature on arts and health to date. Further, the use of a scoping review rather than a systematic review meant that the report could reference studies from diverse methodological and theoretical backgrounds without constraint based on study design or outcome measure, which is important for an area of research that is so interdisciplinary. It should be noted, however, that studies published in languages other than English and Russian were not identified.

A second limitation has been the traditional short and accessible format of these Health Evidence Network reports, which meant that detailed discussion of the strengths and limitations of different methodological approaches or individual studies has not been possible. Discussions within specific studies or the reviews cited here provide further consideration of this point.

Thirdly, it is acknowledged that there are complex logistic and ethical issues in the development and delivery of arts programmes for health. These go beyond the scope of this review, but it is recommended that they should have careful consideration in a future review of their own.

Finally, while this review has highlighted the opportunities for the arts in health and the specific areas where they appear to offer tangible benefit, there are many health conditions and aspects of care where the arts do not play a clinically meaningful role. Further, although not the focus of this review, there is also evidence of the arts leading to negative health effects. For example, stigma surrounding epilepsy has been perpetuated by certain popular songs (955), daily loud music exposure is linked to hearing loss (956), and media portrayals of medicine can cultivate greater health-related fear and unrealistic patient expectations (957,958). Consequently, it should not be assumed that the arts are a panacea, and careful consideration of the literature and informed design of programmes are important.

3.2 Summary of findings

This report has mapped the evidence on the potential value of the arts in the promotion of good health, the amelioration or prevention of a range of mental and physical health conditions, and the treatment or management of acute and chronic conditions arising across the lifespan. Studies have covered a diverse range of arts activities and explored programmes delivered in a range of different locations from hospitals to primary care to the community to the home.

A number of themes can be drawn from this research. First, there is a substantial body of evidence on the health benefits of the arts. Research designs included a spectrum from uncontrolled pilot studies to randomized controlled trials, from small-scale cross-sectional surveys to analyses of nationally representative longitudinal cohort studies, and from individual case studies to community-wide ethnographies. Research methods included psychological scales, biological markers, neuroimaging, behavioural observations, interviews and examinations of clinical records. Research studies also drew on theories from psychology, psychiatry, epidemiology, philosophy, ecology, history, health economics, neuroscience, medicine, health geography, public health, anthropology, and sociology, among others. There was naturally variation in the quality of this evidence, and certain areas where findings remain to be confirmed or understood better. However, this review triangulated findings from different studies, each with a different set of strengths, which helped to address the weaknesses or intrinsic biases of individual studies. Overall, the findings from this review lend credibility to the assertion that the overall evidence base shows a robust impact of the arts on both mental and physical health.

A second theme in the identified research was a focus on conditions for which no complete solutions are available. Here, the arts hold promise in tackling difficult or

complex problems for which there are not currently adequate solutions. Additionally, this review identified how the arts can provide a holistic lens to view conditions that are often treated primarily as physical; this approach fits with current trends in health towards giving parity of esteem to mental health and also towards situating health problems within their social and community context (9,959,960).

A third theme was that the evidence base did not just show efficacy of arts interventions but also showed economic benefits, with some arts interventions showing equivalent or greater cost–effectiveness to possible health interventions. The theoretical framework used for this report focused on the multimodal aspect of arts activities as this is likely to underlie the benefits. Arts interventions can provide multiple health-promoting factors within an activity (e.g. supporting physical activity and with components that support mental health); consequently, they may be more efficient for certain health conditions than the co-prescription of a physical activity intervention and a mental health intervention. Further, the aesthetic component of the arts and the ability to tailor them to have relevance to individuals from different cultural backgrounds means that they can be a route to engaging minority or hard-to-reach groups, who can have higher risks of poor health and concomitantly generate higher health-care costs (961). However, there is a clear need for more economic evaluations of arts interventions within health to quantify the benefits and support the business cases for funding and commissioning.

3.2.1 Gaps and challenges

Building on this, the review also highlighted a number of gaps or challenges.
First, there is substantially more evidence for certain types of arts activity and for certain health conditions. For example, there are far more studies on music, dance and visual arts than on activities such as engagement with festivals and carnivals or online and digital arts. This will not necessarily equate to a greater level of impact from these activities. Similarly, this report focused on areas where there is research evidence but this should not be taken to imply that the arts are a universal palliative. In many notable areas of health there are few or no published studies to date. For example, although there is work that has focused on improving health communication relating to infectious diseases, there is virtually no research on whether the arts can support individuals with infectious diseases. Similarly, very little research has examined the arts and autoimmune disorders. Although there are some studies on neurological conditions such as stroke, there is still limited evidence of the benefits of the arts for conditions such as epilepsy or degenerative neurological conditions. Further, much of the prevention research has focused on primary or secondary prevention. There is very limited research considering

specifically tertiary prevention, such as whether the arts could help in reducing the risk of comorbidities in individuals with either mental or physical illness. Other areas of basic research have only just begun to be explored, such as the arts and epigenetics, and so evidence is limited. Further research is needed, particularly for those conditions where the current evidence base is small. While this report has highlighted some areas where there are inconsistent or null findings, there is an inherent publication bias in the literature towards positive findings. Consequently, future research studies should include null findings to allow a balanced appraisal of where the arts can and where they cannot provide support to health.

Secondly, there are issues in determining the size of an effect, although an increasing number of studies have included control conditions that enable comparisons of the size of effect. In many cases, there is growing evidence that arts interventions can have a clinically meaningful impact, with some studies showing comparable or stronger effects for arts interventions than for medication, non-arts social interventions or other health interventions such as exercise. Consequently, a crucial next step to build on the promising evidence base presented here will be to undertake future studies that focus, in particular, on comparing the size of effect with gold standard treatments or interventions, and to focus on comparing the strength of findings when arts interventions are delivered in isolation against delivery in combination with other medical interventions. This will enable more robust statements regarding the comparative benefits of arts versus non-arts approaches for health. It will also provide vital data on the optimum mode of implementation within prevention or treatment pathways for specific health conditions.

Thirdly, there is limited evidence of interventions being scaled up, either through the roll-out of a specific programme or through local adaptations of interventions. As a result, much of the evidence comes from repeated small-scale interventions, conducted either as validations or as replications. It also remains unclear for certain activities whether the benefits noted are specific to the local, regional or national contexts in which they have been developed. Consequently, there is a need to (i) undertake more process evaluations and studies of implementation of successful interventions to facilitate the uptake of programmes for which there is now a strong evidence base from small-scale interventions; (ii) share in-depth protocols of successful arts interventions to support their scaling up to further locations, such as through providing manuals of interventions following recommended guidelines such as the Template for Intervention Description and Replication (962); and (iii) focus resources into funding for larger-scale studies of interventions where there is promising evidence of efficacy. The evidence presented here suggests that

the arts could have great potential for supporting health, but they still remain an under-tapped resource that need to be harnessed effectively to realize their potential. Further implementation studies could move this field closer to that goal.

Finally, there is limited evidence of the impact of policy implementation, such as how increases or decreases in the funding or provision of the arts in different countries are linked with increases or decreases in the incidence or prevalence of health conditions. Consequently, there is a need to ensure the inclusion of questions on arts and cultural engagement in cohort studies to facilitate more longitudinal research on arts engagement, including natural experiments of policy interventions. Where specific interventions are trialled (e.g. a city becoming European City of Culture) and suitable cohort data are not available for tracking, the development of robust evaluations involving new large-scale data collection should be considered.

3.3 Policy considerations

A number of considerations can be derived from the evidence mapped in this report; these target both the cultural and the social care and health sectors.

Acknowledge the growing evidence base for the role of the arts in improving health and well-being by:

- supporting the implementation of arts interventions where a substantial evidence base exists, such as the use of recorded music for patients prior to surgery, arts for patients with dementia and community arts programmes for mental health;
- sharing knowledge and practice of arts interventions that countries have found effective in their context to promote health, improve health behaviours or address health inequalities and inequities; and
- supporting research in the arts and health, particularly focusing on policy-relevant areas such as studies that examine interventions scaled up to larger populations, or studies that explore the feasibility, acceptability and suitability of new arts interventions.

Recognize the added health value of engagement with the arts by:

- ensuring that culturally diverse forms of art are available and accessible to a range of different groups across the life-course, especially those from disadvantaged minorities;

- encouraging arts and cultural organizations to make health and well-being an integral and strategic part of their work;
- actively promoting public awareness of the potential benefits of arts engagement for health; and
- developing interventions that encourage arts engagement to support healthy lifestyles.

Note the cross-sectoral nature of the arts and health field through:

- strengthening structures and mechanisms for collaboration between the culture, social care and health sectors, such as introducing programmes that are cofinanced by different budgets;
- considering the introduction, or strengthening, of lines of referral from health and social care to arts programmes, for example through the use of social prescribing schemes; and
- supporting the inclusion of arts and humanities education within the training of health-care professionals to improve their clinical, personal and communication skills.

4. CONCLUSIONS

This report found evidence from a wide variety of disciplinary approaches and methodologies for the potential value of the arts in contributing to core determinants of health; playing a critical role in health promotion; helping to prevent the onset of mental illness and age-related physical decline; supporting the treatment or management of mental illness, noncommunicable diseases and neurological disorders; and assisting in acute and end-of-life care. Although some countries have made progress in developing policies that make use of the arts to support health and well-being, many have not yet addressed the opportunities that exist for using the arts to support health, and for others policy activities have been time limited.

Therefore, in light of the size of the evidence base mapped, this report raises a number of policy considerations for members of the WHO European Region to support the development of long-term policies or strategies that will provide more synergized collaboration between health and arts sectors that could realize the potential of the arts for improving global health. As many of these priorities align with existing priorities and declarations, the development of new programmes that implement these policies should be of mutual benefit to the arts and to health and social care internationally.

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ANNEX 1. SEARCH STRATEGY

Scoping review

A scoping review aims to map the existing literature in a field and provides an opportunity to identify key concepts, gaps in the research, and types and sources of evidence to inform practice, policy-making and research (1). However, unlike systematic reviews, scoping reviews do not have to pre-specify either study designs or precise inclusion/exclusion criteria. Further, results from scoping reviews are ordinarily narrative and descriptive with the aim of providing an overview, rather than involving synthesis or judging the quality of individual studies (1,2). A scoping review was felt to be an appropriate approach given that (i) this report took a broad overview, exploring diverse areas of arts and health research, so undertaking multiple full systematic reviews was beyond the scope of this project; (ii) research on this topic is heterogeneous in its design, so it was not desirable to restrict the literature by pre-specifying particular methodologies; and (iii) this report was policy directed, which is a common aim in conducting a scoping review.

Databases and websites

Searches were undertaken in both English and Russian with no geographical limitation using databases, including the Cochrane Library and PubMed and relevant journals for the period from January 2000 to May 2019. Thorough hand-searches included recent citations of key texts. Although some grey literature is included here, grey literature is covered more thoroughly in the report *Creative Health* (3).

Search terms

The literature search was focused on any studies involving human participants who had engaged in any arts activity, following the definition provided in section 1.1.1, with the research discussing any outcome measure relating to the promotion, prevention, treatment or determinant of mental or physical health. Studies were excluded if:

- they were animal studies;
- they focused exclusively on architecture or design (which constitutes a large literature beyond that discussed here);

- they involved broader activities outside the scope of our definition of arts, such as gardening, engagement with the natural environment, cookery, sports or religion; or
- full papers were not available in either English or Russian.

All study designs and methodologies were considered. Consequently, keyword searches used (i) terms relating to arts and cultural engagement and (ii) terms relating to health. These keywords were selected through consideration of keywords used in recent systematic reviews of the literature, discussions with researchers and following guidelines from the WHO categories of physical and mental disease, supportive health and social determinants of health.

Table A1.1 outlines the search blocks within arts terms and Table A1.2 outlines those within health terms.

Table A1.1. Search blocks within arts terms

Search block	Search terms
Performing arts	singing OR dancing OR musical instrument OR drama OR performing in a play OR acting OR drama OR opera OR magic tricks OR circus skills
Visual arts, design and craft	painting OR drawing OR printmaking OR sculpture OR pottery OR calligraphy OR jewellery making OR textile OR crafts OR embroidery OR crocheting OR knitting OR wood crafts OR woodwork OR carving OR furniture making
Literature related	reading for pleasure OR creative writing OR composing music OR stories OR story-telling
Cultural engagement	community arts OR cultural festivals OR fairs OR cultural events OR museums OR galleries OR theatre OR concerts OR exhibitions
Online, digital and electronic arts	digital artworks OR computer animations OR film-making OR videos OR photography OR radio plays OR television dramas
Creativity	creative OR creativity

Table A1.2. Search blocks within health terms

Search block	Search terms[a]
Acquired brain injury/ neurological	neurological OR hemiplegia OR stroke Or coma OR blast injury OR brain injury OR paralysis OR disorders of consciousness OR epilepsy OR neurodegenerative OR motor neuron disease (MND) or amyotrophic lateral sclerosis (ALS) OR migraines OR Parkinson's OR Huntington's OR stroke OR cerebral palsy
Autism	autism OR autistic OR Asperger's
Bereavement	bereaved OR bereavement OR end of life OR palliative OR hospice OR death OR dying OR grieving
Cancer	cancer OR oncology OR tumour OR neoplasm OR biopsy
Carer	carers OR caring OR caregiving OR family
Clinical skills, treatment adherence, health communication, health-related behaviour and health-related stigma	clinical skills OR adherence OR treatment adherence OR messaging OR health messaging OR health communication OR communication OR health promotion OR promotion OR stigma OR hospital environment OR clinical environment OR vaccine
CVD	cardiovascular disease OR coronary heart disease OR heart disease OR heart attack OR heart failure OR hypertension
Dementia	dementia OR Alzheimer's OR cognition OR cognitive OR memory
Dentistry	dentist OR dental
Diabetes	diabetes OR blood glucose
Disability	physical disability OR mental disability OR cognitive impairment OR intellectual impairment OR sensory impairment OR special needs OR special education OR dyslexia
Developmental disorders	developmental disorders OR attention deficit hyperactivity disorder OR ADHD OR Tourette's

Table A1.2. contd

Search block	Search terms[a]
Educational attainment	education OR learning OR attainment OR bullying OR cognition OR behaviour OR social OR development OR creativity OR intelligence OR personal OR skills
Frailty	frailty OR falls OR falling OR balance OR osteoporosis OR arthritis
Genetic disorders	genetic disorders OR Downs syndrome OR cystic fibrosis OR sickle cell
Health behaviours	health behaviours OR diet OR nutrition OR obesity OR underweight OR malnourished OR exercise OR smoking OR alcohol OR drugs
Health and social inequalities and inequities	health inequalities OR low income OR inequality OR inequalities OR inequities OR inequity OR at risk OR social isolation OR isolation OR deprived OR deprivation OR maltreatment OR poverty OR malnourished OR marginalisation OR marginalised OR discrimination OR social justice OR employment OR minority OR minorities OR ethnic OR racial OR racism OR homeless OR injustice OR criminal justice OR justice OR prison OR inmates OR prisoners OR soldiers OR veterans OR military OR war OR anti-war OR terrorism OR terrorist OR cohesion OR cohesive OR isolated OR inclusive OR inclusion OR peace OR loneliness OR social consciousness OR bonding
Immune system	immune system OR immunity OR immunodeficiency OR inflammation OR inflammatory
Infectious diseases	infectious diseases OR communicable diseases OR TB
Lung health	lung health OR breathing OR respiratory OR asthma OR chronic obstructive pulmonary disease OR dyspnoea
Mechanical ventilation/ intensive care	mechanical ventilation OR intensive care

Table A1.2. contd

Search block	Search terms[a]
Mental health	mental health OR well-being OR stress OR sleep OR insomnia OR depression OR anxiety OR suicide OR OCD OR obsessive compulsive disorder OR psychotic OR bipolar OR schizophrenia OR addiction OR bulimia OR anorexia OR phobia OR personality disorder
Mother and infant health	pregnancy OR pregnant OR perinatal OR prenatal OR postnatal OR postpartum OR mothers OR parents OR infant OR parent-infant OR premature OR neonatal OR labour OR caesarean OR vaginal delivery or abortion OR miscarriage OR fertility
Sexual health	sexual health OR STD OR STI OR HPV OR HIV/AIDS
Speech and language	speech OR language OR stuttering OR stammering OR aphasia
Surgery, invasive procedures and rehabilitation	surgery OR procedure OR treatment OR hospital OR clinical OR recovery OR medical OR operative OR invasive OR rehabilitation
Trauma	trauma OR abuse OR refugee OR torture OR violence OR post-traumatic stress disorder OR PTSD
Well-being	well-being OR life satisfaction OR hedonic OR eudemonic

[a] Searches included terms with and without an apostrophe (e.g. Parkinson's, Parkinsons, Parkinson).

Thematic organization

Following searches, identified abstracts were screened and those of relevance to the search focus outlined above were then read in full. Literature was initially summarized in relation to the headings identified above, and then underwent further regrouping by common themes. This was undertaken independently by the two authors and then themes were compared and combined. This provided two primary themes and a series of secondary and tertiary themes, which form the structure of the results section of this report.

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