Arts Strategies for Addressing the Opioid Crisis: Examining the Evidence

Key Findings from a Literature Review and Program Scan on the Arts, Pain Management, and Substance Use Disorder

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Cover photo: Mural Arts teaching artist Brad Carney and students from Philadelphia, Pennsylvania's Northeast High School install a panel of artist Joe Boruchow's *Smoke Signals* at 448 North 10th Street. Photo by Steve Weinik, courtesy of Mural Arts Philadelphia

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Preface

Before February 2020, opioid abuse and addiction qualified as the most significant public health issue in the United States. Now that national attention has shifted from this epidemic to a *bona fide* pandemic, it may be easy to forget how truly devastating this particular type of substance abuse disorder is for victims, families, and whole communities. However, recent news reports suggest we may be seeing an increase in opioid-related mortality in part because of isolation and lack of access to treatment due to shelter-at-home protective orders. Although this report was commissioned long before COVID-19 erupted, it shows that results are promising when arts strategies were integrated thoughtfully with clinical and community-based health solutions. Given the present-day strain on the public health system, these lessons may prove more valuable than ever before.

For this National Endowment for the Arts report, the researchers combed hundreds of studies spanning 20 years to analyze the most rigorous data about the arts' applicability to issues of substance abuse, addiction, recovery, and pain management. In addition to reviewing this literature, the researchers consulted experts, databases, and other sources to identify model programs throughout the report. Lastly, the authors describe research opportunities which, if pursued, would strengthen the evidence base for arts interventions used to combat the opioid problem.

Across all arts-based approaches, music programs and music therapy attracted the most numerous and rigorous studies about the benefits to substance abuse prevention, recovery, and pain management. The relationship of the arts to health outcomes more broadly is the focus of an ongoing research partnership between the Arts Endowment and the National Institutes of Health (NIH), through targeted grants on this topic since 2019.

In addition, resulting from the "Sound Health" partnership with NIH and the John F. Kennedy Center for the Performing Arts, the Arts Endowment supports the Sound Health Network, a national initiative at the nexus of music, neuroscience, and health and wellness. Music therapy practice and research are also critical to Creative Forces: the NEA Military Healing Arts Network, a partnership with the U.S. Departments of Defense and Veterans Affairs and state and local arts agencies that seeks to improve the health, wellness, and quality of life of military personnel and veterans exposed to trauma.

Trauma is certainly the condition of those grappling with opioid addiction or other substance abuse disorders. This Arts Endowment report offers hope through evidence-based resources about the arts' healing power, even as the nation copes with a distinctly different public health crisis.

Mary Anne Carter
Chairman
National Endowment for the Arts

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Executive Summary

In October 2017, the U.S. Department of Health and Human Services declared the opioid crisis a national public health emergency and prioritized identifying effective, evidence-based strategies for pain management and the prevention and treatment of substance use disorder (SUD).[a,1]

Increasingly, the arts have become more widely established and accepted as health-promoting practices in the United States and around the world.[2,3] Research indicates that engagement in the arts has significantly positive effects on physical symptoms, psychological health, and social relationships.[4,5] As the U.S. healthcare system moves toward greater integration of physical and behavioral health[6], arts-based interventions should be considered among potential complementary approaches for managing pain and preventing and treating SUD.

The purpose of this report is to describe the evidence on the role of the arts in the management of pain and in the prevention and treatment of SUD. Grounded in a **literature review** and **program scan**, the report identifies promising arts-based strategies to assist individuals, communities, health practitioners, and policymakers in responding to the present-day opioid crisis.

Key findings from the literature review include the following:

- **Of the 116 articles that were eligible for inclusion, most (102 articles, or 88 percent) evaluated a music-based intervention.**
  - Music listening was shown to **reduce pain** and **reduce consumption of pain medication**.
    - Of 79 studies that measured the impact of an arts-based intervention on *pain reduction*, 58 (or 73 percent) reported a statistically significant positive effect. Of those 58 studies, 51 (or 88 percent) evaluated listening to music.
      - Of the 17 studies that measured the impact of an arts-based intervention on *use of pain medication*, ten (or 59 percent) reported a statistically significant positive effect. Of those ten studies, all evaluated listening to music.
    - Music also was shown to **improve readiness and motivation for SUD treatment** and **to reduce craving**.
      - Of the six music therapy studies that measured outcomes related to SUD treatment readiness and motivation, four reported statistically significant positive effects.
      - Of the five music studies that measured craving, three (two music therapy, one music-listening) reported statistically significant positive effects.
- Additional research is warranted to examine the arts' role in **SUD prevention**.
  - Research demonstrates that arts-based prevention programs may impact risk and protective factors for SUD, including socioemotional development, self-esteem, and academic outcomes. However, those studies fell outside the scope of the present literature review because the arts programs did not explicitly target or measure outcomes specific to SUD.

Key findings from the program scan include the following:

- Arts-based pain management programs delivered in community and/or healthcare settings **target isolation and stigma** among individuals with pain. Targeting the psychological and social aspects of pain is a potential strategy for arts-based programs to support individuals at risk for SUD.

a The definition of SUD and other key terms can be found in the glossary.

- Similarly, arts-based programs **address social aspects of SUD**, **improving community awareness** of SUD and **reducing stigma** to promote resilience and recovery.

Findings from the literature review and program scan highlight several limitations and evidence gaps. To address these gaps, a number of directions for future research are recommended:

- **Future studies should examine the impact of arts-based interventions other than music.** Only a handful of studies in the literature review did this. Additional research is needed to inform the evidence base on a wider array of art forms and creative arts therapies.
- **More studies are needed to assess the maintenance of benefits from arts-based interventions over time. Future studies should examine the following questions:**
    - Can postoperative, arts-based pain management programs prevent the development of chronic pain and disability and/or chronic opioid use and opioid use disorder (OUD)?
    - Can arts-based SUD prevention programs prevent the development of SUD?
    - Can arts-based SUD treatment programs promote long-term and sustained recovery?
- **Research is needed to examine the arts' role in SUD prevention.** Programs included in the program scan draw on positive youth development theory and practice to help participants develop protective factors against SUD. However, a knowledge gap exists between these practices and the empirical evidence base, as reported in peer-review journal articles. To measure the impact of their SUD prevention programs, arts practitioners and creative arts therapists should collaborate with researchers grounded in program evaluation skills and methodologies.
- **There is a need for research specifically on individuals with OUD.** No studies in this review limited their sample to individuals with OUD. While OUD is similar to other types of SUD in many respects, it has several unique features. Future research should examine the role of arts-based interventions in the prevention and treatment of OUD.
- **Researchers in arts and health disciplines should establish core outcomes, metrics, and reporting guidelines.** The literature review found great variation in the quality and consistency of reporting. Missing information made it difficult to collect and synthesize study characteristics. Creating a shared set of core outcomes and reporting guidelines for arts-based interventions would improve research strategies, reporting, evidence synthesis, and future collaboration.

Introduction

Opioids[b] are natural or synthetic chemicals that reduce the intensity of pain signals and feelings of pain.[7] Historically, the use of opioids for the treatment of acute pain has been accepted, while their use for managing chronic pain has been controversial.[8] In the 1990s, U.S. medical practice began a considerable shift toward a more liberal use of opioids for chronic non-cancer pain.[9] Increased prescription of opioid medications led to a sharp increase in the prevalence of opioid use disorder (OUD), which, in turn, contributed to a rise in heroin use and opioid overdose deaths.[10, 11, 12] Opioid overdose deaths in the United States were five times higher in 2016 than in 1999.[13]

In October 2017, the U.S. Department of Health and Human Services declared the opioid crisis a national public health emergency and announced a five-point strategy with the following priorities:

- Improve access to prevention, treatment, and recovery support services.
- Target the availability and distribution of overdose-reversing drugs.
- Strengthen public health data reporting and collection.
- Support cutting-edge research on addiction and pain.
- Advance the practice of pain management.[14]

These federal priorities affirm the importance of identifying effective, evidence-based strategies for pain management and the prevention[c] and treatment of substance use disorder (SUD).

Increasingly, the arts have become more widely established and accepted as health-promoting practices in the United States and around the world.[15, 16] As the U.S. healthcare system moves toward greater integration of physical and behavioral health,[17] arts-based interventions should be considered among potential complementary approaches for managing pain and preventing and treating SUD. For the purposes of this report, the arts encompass various branches of creative activity, such as music, painting, literature, and dance. The arts include informal art activities (e.g., listening to music), formal art activities (e.g., a music class), and creative arts therapies (e.g., a structured therapeutic program using music led by a certified music therapist).

This report seeks to present available evidence on the relationships between the arts and (1) pain management and (2) the prevention and treatment of SUD, including OUD. Drawing from a literature review and program scan, it addresses the following research questions:

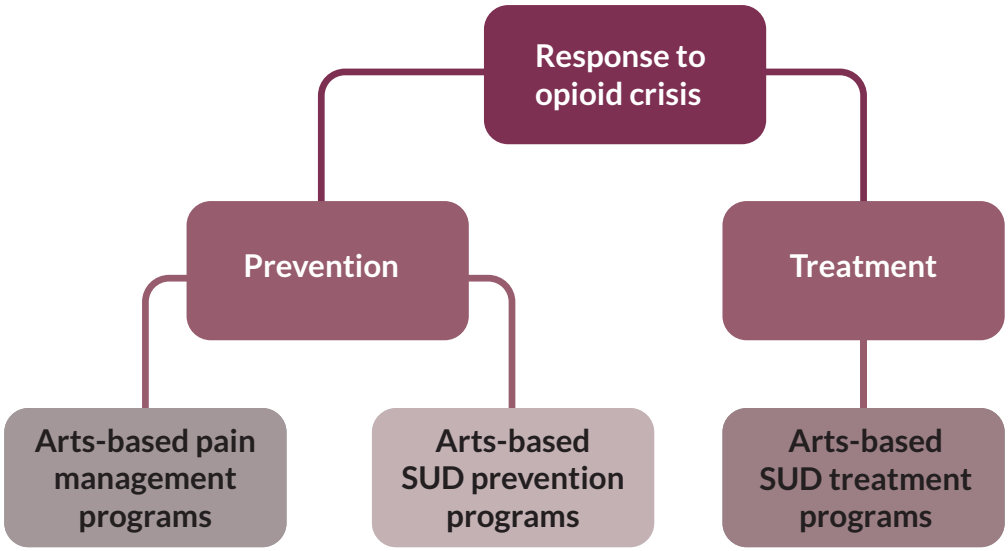
1. What is the evidence on the role of the arts in pain management?
2. What is the evidence on the role of the arts in the prevention of SUD, including OUD?
3. What is the evidence on the role of the arts in the treatment of SUD, including OUD?

The report will highlight the arts' potential role in prevention and treatment efforts that respond to the opioid crisis in the United States (*see Exhibit 1).*

b The definition of opioids and other key terms can be found in the glossary.

c For the purposes of this report, the term "prevention" is used to refer to both the prevention of substance use and the prevention of the transition from substance use to substance use disorder.

Exhibit 1. The Arts and the Opioid Crisis



The three domains of interest in this report are: 1) the arts and health; 2) pain; and 3) SUD. By examining the relationships between arts-based interventions and pain and SUD, we will inform the arts' relevance to the present-day opioid crisis. Below is an overview of each domain of interest.

The Arts and Health

Arts-in-medicine programs are emerging domestically and worldwide[18] as more medical professionals recognize the role the arts can play in the healing process. Surveys conducted by the then-named Society for the Arts in Healthcare (now the Arts and Health Alliance) found that approximately 45 percent of healthcare institutions had some type of arts program in 2004 and 2007. Most programs featured musicians (82 percent), performing artists (46 percent), or visual artists (40 percent).[19]

The arts can influence health through several mechanisms. Originally developed by George Engel in 1977 as a way to integrate psychosocial components into medicine, the biopsychosocial model of care integrates the biological, psychological, and social characteristics of the individual into our understanding of health and disease.[20] Research indicates that engagement in arts activities and/or clinical arts-based interventions can positively influence biological and psychological health and social relationships.[21, 22]

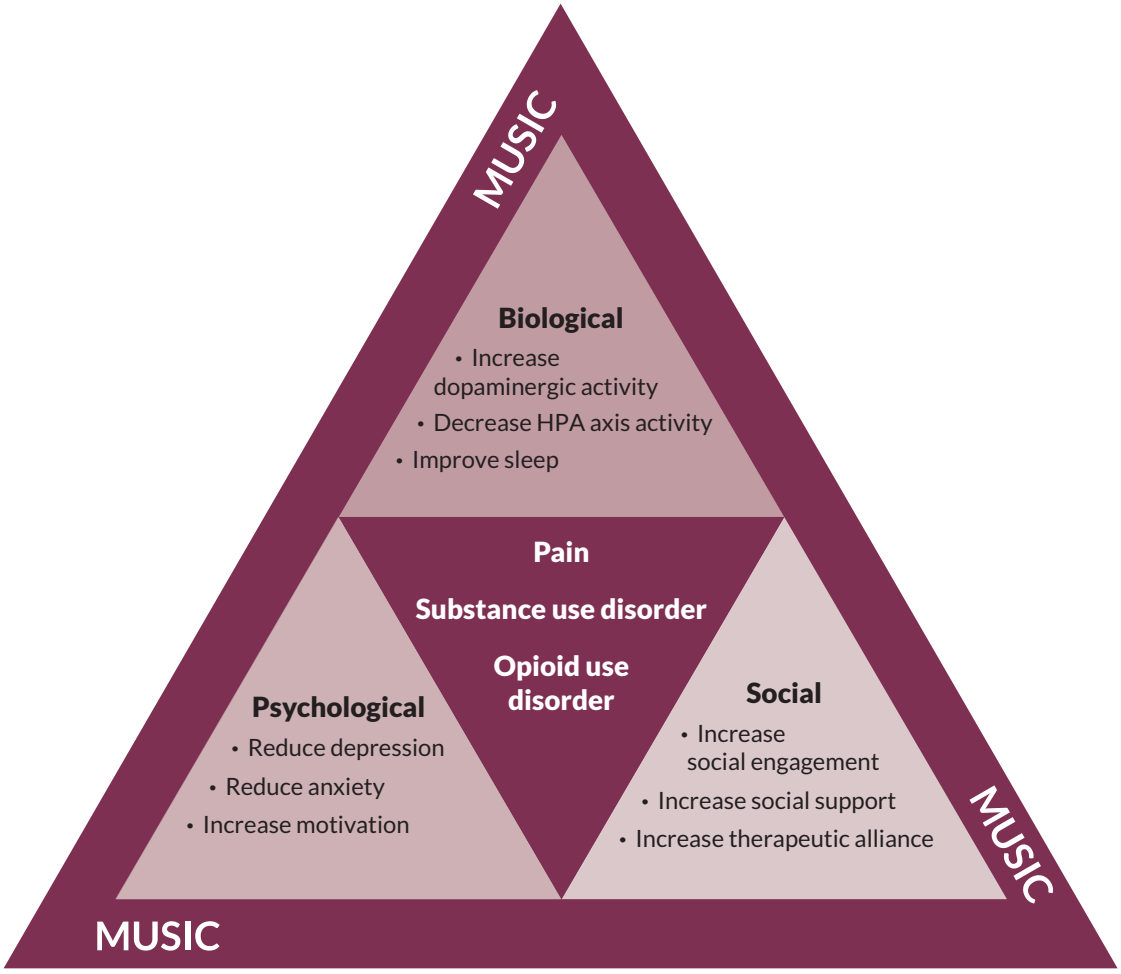
To date, music, the most-researched medium of art and healing,[23, 24] has been found to do the following:

- Improve blood pressure[25]
- Improve sleep quality[26]
- Decrease activity in the hypothalamus-pituitary-adrenal (HPA) axis, the body's central response system to stress[27]
- Activate parts of the brain that play a role in descending inhibition of pain, such as opioid-rich midbrain nuclei[28, 29]
- Reduce anxiety and pain[30]

- Reduce depressive symptoms[31]
- Elicit social bonding[32]

The biopsychosocial model organizes these outcomes into multiple pathways through which music might influence pain, SUD, and OUD *(see Exhibit 2)*.

Exhibit 2. Music and the Biopsychosocial Model of Care



This theoretical framework helps illustrate the potential of the arts to influence these outcomes, but more research is needed to understand the pathways between the arts, more broadly, and pain management and SUD.

Pain

Pain is a pervasive and global public health problem. It is the most common reason adults seek healthcare in the United States, and pain relievers are the medications most often prescribed by hospital emergency and outpatient departments.[33] Recent national estimates suggest that the annual cost of pain care exceeds annual costs for heart disease, cancer, and diabetes combined.[34, 35, 36]

Pain is commonly classified as acute or chronic based on how long it lasts and its connection to tissue injury (e.g., damage to muscles, ligaments, or tendons).[37] Acute pain often comes on suddenly and has a specific cause. Common causes of acute pain include surgery, broken bones, dental work, burns or cuts, and labor and childbirth.

Acute pain can develop into chronic pain, persisting for months or even years. Chronic pain is often linked to conditions such as back and neck pain, osteoarthritis, headache, nerve pain, and fibromyalgia pain. In many instances, chronic pain occurs because the underlying physiological condition (e.g., arthritis) is ongoing and unresolved. In other cases, chronic pain does not appear to be caused by any disease, injury, or detectable damage to the nervous system (e.g., fibromyalgia pain).

Pain Management

According to the 2015 National Survey on Drug Use and Health, one in three adults used prescription opioids for pain in the United States.[38] Individuals who receive opioid therapy after an acute problem, such as a surgery or injury, sometimes transition to chronic opioid use.[d, 39, 40] Chronic opioid use, in turn, increases the risk of OUD and overdose.[41] Most people who misuse opioids report doing so to relieve physical pain (63 percent).[42]

A growing number of healthcare professionals and researchers have called for comprehensive pain management strategies that include evidence-based, nonpharmacological options. As the Academic Consortium for Integrative Medicine & Health Inter-agency Pain Task Force wrote in its 2018 call to action, "Medical pain management is in crisis; from the pervasiveness of pain to inadequate pain treatment, from the escalation of prescription opioids to an epidemic in addiction, diversion, and overdose deaths."[43] The task force asked for continued research into effective nonpharmacological treatments for pain. That same year, the Joint Commission, the nation's oldest healthcare accreditor, began requiring organizations to develop nonpharmacologic pain treatment strategies.[44] Acceptable options suggested by the Joint Commission include music therapy.[45]

In 2019, the Pain Management Best Practices Inter-Agency Task Force, a federal advisory committee established by the Comprehensive Addiction and Recovery Act of 2016, released its final report highlighting five broad categories for pain treatment. One category—complementary and integrative health approaches—included art and music therapy as well as acupuncture and mindfulness.[46] The report recommended further research on complementary and integrative health approaches to determine their therapeutic value, risk and benefits, and mechanisms of action.

Substance Use Disorder

SUD impacts millions of people nationally. In 2018, approximately 20.3 million people aged 12 or older in the United States had an SUD related to use of alcohol or illicit drugs in the past year. This includes 14.8 million people who had an alcohol use disorder and 8.1 million people who had an illicit drug use disorder.[47] The most common illicit drug use disorder was marijuana use disorder (4.4 million people). An estimated 2.0 million people had OUD, including 1.7 million people with a prescription pain reliever use disorder and 0.5 million people with a heroin use disorder.[48]

d Although there are different definitions of long-term and/or chronic use based on number of prescriptions or days of supply, the prevalence of those who transition from opioid initiation to long-term or chronic opioid use is consistent at about 5 to 7 percent for general populations. The higher the dose of the medication, the more likely patients are to make this transition. Treatment duration is also important. While the rate of long-term use (on opioids one year after receiving opioid therapy) was relatively low (6.0 percent) for persons with at least one day of opioid therapy, the rate increased to 13.5 percent for persons whose first episode of use was for more than eight days and to 29.9 percent when the first episode of use was for more than 31 days.

The public health effects of prescription opioids (e.g., oxycodone) and illicit opioids (e.g., heroin) are intertwined.[49] Heroin is less expensive than prescription opioids, and many who develop OUD from prescription opioids later switch to heroin.[50] One study found that 80 percent of sampled heroin users said their opioid use began with prescription opioids.[51]

Drug overdose deaths in the United States more than quadrupled from 1999 to 2017. Nearly 70 percent of the 70,237 drug overdose deaths reported in 2017 involved a prescription or illicit opioid.[52] While the statistics on overdose deaths are compelling, they do not fully convey the human toll of the opioid crisis. In 2017, an estimated 2.2 million children and adolescents were in crisis due to a parent's OUD.[53] Children and families impacted by OUD face a myriad of adverse consequences, including increased risk of mental health problems and drug use; accidental opioid poisoning; increased risk of developing an SUD; and family dissolution that results from parents' incarceration, foster care placement, or loss of parent to an opioid overdose.[54] The risk of death and other significant consequences of OUD, including intergenerational effects, underscore the importance of preventing and treating SUD.

Substance Use Disorder Prevention and Treatment

Evidence-based programs aiming to prevent SUD target risk factors and enhance protective factors. Many risk factors associated with SUD in young people also predict other problems, including delinquency, mental health conditions, violence, and school dropout.[55] Therefore, even programs focused on other issues impacting youth may help prevent SUD. Likewise, a range of factors may help to prevent adolescent substance use, including individual factors, such as having goals and aspirations for the future, and environmental factors, such as connections to prosocial peers.[56] Prevention can also take root in healthcare settings that use safe prescribing practices, which have been shown to reduce overdoses involving prescription opioids.[57]

Treatment programs for patients with SUD are designed to help individuals stop or reduce harmful substance misuse, improve their health and social functioning, and manage their risk for relapse. In 2018, only about 10 percent of Americans with SUD received substance use treatment at a specialty facility.[58] Among those who did receive treatment, completion rates were low (41 percent)[59] and relapse rates were high (40–60 percent).[60] There is a great need to improve access to and effectiveness of SUD treatment.

Current Report

Previous research has examined the association between the arts, pain management, and SUD treatment. Although a meta-analysis and three systematic reviews reported positive results for music's impact on pain[61] and SUD treatment,[62, 63, 64] they excluded other art forms. Similarly, most reports include only studies using randomized controlled trial (RCT) or controlled clinical trial designs. As a result, these reviews may have missed literature that can inform the relationships between the arts, more broadly, and pain management and SUD.

This report aims to describe the state of the evidence concerning the relationships between the arts and (1) pain management and (2) the prevention and treatment of SUD. Drawing from a literature review and program scan, it will explore the arts' possible role in prevention and treatment efforts and highlight existing program strategies to support individuals at risk for OUD.

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Literature Review

An integrative literature review[e] was conducted to summarize and synthesize empirical research on the arts and pain management, SUD prevention, and SUD treatment. This chapter summarizes key findings by research question. It then presents methods used in the literature review and detailed results, also organized by research question. A list of studies reviewed can be found in appendix A.

Overview of Key Findings

This section presents key findings by research question.

Research Question 1. What is the evidence on the role of the arts in pain management?

Key finding: The evidence suggests that listening to music may reduce pain and the use of pain medication.

- The search process resulted in 79 studies on the topic of pain management.
- Of the 79 studies, 72 evaluated a music-based intervention. Of these 72 studies, 65 evaluated listening to music.
- Of the 79 studies that measured the impact of an arts-based intervention on pain reduction, 58 reported a statistically significant positive effect. Of those 58 studies, 51 evaluated listening to music.
- Of the 17 studies that measured the impact of an arts-based intervention on use of pain medication, ten reported a statistically significant positive effect. Of those ten studies, all evaluated listening to music.

Research Question 2. What is the evidence on the role of the arts in the prevention of SUD, including OUD?

Key finding: Additional research is needed to examine the role of the arts in the prevention of SUD.

- The search resulted in one study on the topic of SUD prevention, so no conclusion can be drawn.
    - Research demonstrates that arts-based prevention programs may impact risk and protective factors for SUD, including socioemotional development, self-esteem, and academic outcomes. However, these studies fell outside the scope of present literature review because the programs did not explicitly target or measure outcomes specific to SUD.

Research Question 3. What is the evidence on the role of the arts in the treatment of SUD, including OUD?

Key finding: Music-based interventions, such as group music therapy, may improve readiness and motivation for SUD treatment and reduce craving.

e An integrative review employs a systematic approach to search for literature and allows for the inclusion of diverse methodologies (i.e., experimental and nonexperimental research). For more information, see Robin Whittemore and Kathleen Knafl, "The Integrative Review: Updated Methodology," *Journal of Advanced Nursing* 52, no. 5 (2005): 546–53.

- The search process resulted in 36 studies on the topic of SUD treatment.
- Of the 36 studies, 30 evaluated a music-based intervention. Of these 30 studies, 26 evaluated group music therapy.
- Of the six music therapy studies that measured outcomes related to SUD treatment readiness and motivation, four reported statistically significant positive effects.
- Of the five music studies that measured craving, three (two music therapy, one music listening) reported statistically significant positive effects.

Methods

An integrative literature review was conducted to summarize and synthesize empirical research on the arts and pain management, SUD prevention, and SUD treatment. The review did not aim to assess clinical effectiveness of a specific intervention, so a meta-analysis was not conducted. The search strategy included a search of publication databases, using a combination of search terms. The database searches produced 879 studies, of which 51 were eligible for inclusion. Researchers also performed backward and forward reference searches, identifying and retrieving additional sources (including gray and white literature) by following chains of citations and sources identified in the initial search; this yielded an additional 54 articles eligible for inclusion. Finally, 13 additional studies were identified through table of contents searches of select journals, for a total of 116 articles eligible for inclusion in the final report. See appendix B for detailed methods.

To be included in this review, studies had to meet the following criteria:

1. The intervention or program emphasized use of the arts to manage pain or to prevent or treat SUD;
2. The intervention or program had a goal of managing pain or preventing or treating SUD;
3. The article discussed outcomes specific to managing pain or preventing or treating SUD;
4. The article was published in English; and
5. The article was published between January 1999 and July 2019.

Abstracts were screened and excluded if the study sample did not represent the target population (i.e., individuals at risk for OUD or other SUD). For example, studies of individuals receiving palliative care and studies that include young children were excluded, including studies of infants with neonatal abstinence syndrome. Pain management studies were also excluded if the sample was not a clinical population (e.g., experimentally induced pain). In total, 116 studies met the inclusion criteria.

For each study, necessary data were reviewed and abstracted and a Mixed Methods Appraisal Tool (MMAT)[f, 65] checklist was completed to inform the quality of the evidence (e.g., type and quality of methodological design). The MMAT includes five individual checklists, one each for qualitative studies, quantitative randomized controlled trials, quantitative nonrandomized studies, quantitative descriptive studies, and mixed methods research studies. Each checklist includes five design-specific quality criteria and guidance for appraising the presence or absence of each item. The results section includes aggregate MMAT results for each research question. Appendix C contains detailed MMAT results.

f The MMAT checklist was selected because it was developed to provide a quality appraisal of quantitative, qualitative, and mixed methods designs, all of which are represented in this review. Other frameworks, such as Grading of Recommendations, Assessment, Development, and Evaluations, cannot be applied to mixed methods designs.

Results

This section presents results by research question.

Research Question 1. What is the evidence on the role of the arts in pain management?

The search process resulted in 79 studies on the topic of pain management.

Study Characteristics

Most pain management studies were conducted outside the United States and evaluated a music intervention that targeted postoperative pain. The intervention typically involved passive participation,[g] such as participants listening to music on their own. A study in Greece, for example, examined the effect of listening to 30 minutes of researcher-selected classical music through earphones on postoperative pain among inpatients (n = 87) recovering from major abdominal surgery.[66] Exhibit 3 summarizes selected study characteristics.

Exhibit 3. Selected Characteristics of Pain Management Studies (n = 79)

Characteristic	Description	Number	Percentage	Notes
Location	International	54	68	Common countries: Iran (n = 9); United Kingdom (n = 5); Sweden (n = 4); Turkey (n = 4); China (n = 4)
	United States	25	32	
Art form	Music	72	91	
	Other	7	9	Other arts forms: dance (n = 2); literature (n = 1); poetry (n = 1); drawing (n = 1); museum tours (n = 1); painting/beadwork/crafts (n = 1)
Participation	Passive	68	86	Activities: listening to music (n = 66); taking museum tours (n = 1); reading poetry aloud (n = 1)
	Active	11	14	Activities: music therapy (n = 4); dance (n = 2); singing (n = 2); drawing (n = 1); music improvisation (n = 1); painting/beadwork/crafts (n = 1)
Program format	Individual	71	90	
Target population	Individuals with postoperative pain	46	58	Common surgeries: gynecological procedures/cesarean section or childbirth (n = 10); abdominal (n = 7); cardiac (n = 5); hernia or varicose veins (n = 4)
	Individuals with chronic pain	25	32	Specified conditions: fibromyalgia (n = 3); burns (n = 3); back pain (n = 2)
	Individuals with cancer pain	8	10	

Note: Characteristics are not mutually exclusive.

g Active participation is defined as being involved in artistic production by making, doing, or creating something. Passive participation is defined as not being involved in creative expression. For more information, see Alan Brown, Shelly Gilbride, and Jennifer Novak, "Getting In on the Act: How Arts Groups Are Creating Opportunities for Active Participation," The James Irvine Foundation, San Francisco (2011)

Methodological Quality

Among the 54 studies using an RCT design, all missed the MMAT design criterion of blinding outcome assessors to the provided intervention. Because pain is typically measured through self-report, the participant is often the outcome assessor. And because participants typically know whether they received an art intervention, they are often not blinded to the intervention. If this item is excluded from the MMAT, 29 (54 percent) RCTs met all quality criteria. Second to blinding, the most frequently missed criteria were if randomization was appropriately performed and if groups were comparable at baseline. Exhibit 4 presents an overview of MMAT results. See appendix C for a full report.

Exhibit 4. Overview of Mixed Methods Appraisal Tool Results for Pain Management Studies (*n* = 79)

MMAT category	Number	Percentage	Percentage meeting all quality criteria for study design
Qualitative	1	1	100
Quantitative randomized controlled trial	54	68	0
Quantitative nonrandomized	15	19	23
Quantitative descriptive	2	3	50
Mixed methods	7	9	71

Note: All RCTs missed the design criterion of blinding outcome assessors to the provided intervention by asking participants to self-report pain.

Study Outcomes

All 79 studies measured pain. Overall, 58 studies (73 percent) reported a statistically significant positive impact on pain reduction (*see Exhibit 5*). Statistically significant positive results were reported by 36 studies (78 percent) of postoperative pain, 6 studies (75 percent) of cancer pain, and 16 studies (64 percent) of chronic pain.

Of the 17 studies that measured analgesic use, ten studies (59 percent) reported a statistically significant positive effect. For example, a study in Iran found that, compared with a control group (*n* = 30), participants who listened to researcher-selected music during urological or abdominal surgery (*n* = 30) had lower postoperative pain levels and lower consumption of narcotic drugs.[67]

Exhibit 5. Selected Outcomes of Pain Management Studies (*n* = 79)

Outcome	Measured		Statistically significant positive effect		Notes
	Number	Percentage	Number	Percentage	
Overall pain reduction	79	100	58	73	
Postoperative pain reduction	46	58	36	78	
Chronic pain reduction	25	32	16	64	
Cancer pain reduction	8	10	6	75	
Mental health/ well-being	40	51	28	70	Includes depression, anxiety, stress, relaxation, hope, etc.
Analgesic use	17	22	10	59	
Physiological parameters	10	13	6	60	Includes blood pressure, heart rate, respiratory rate, serum cortisol, etc.

Note: Outcomes are not mutually exclusive; many studies measured multiple outcomes.

Research Question 2. What is the evidence on the role of the arts in the prevention of SUD, including OUD?

The search resulted in one study[68] on the topic of SUD prevention.

Study Characteristics

The study (n = 283) used a single-group pre-/posttest design to examine whether attending a theater production about substance abuse[h] would increase awareness and understanding of the risk and protective factors associated with alcohol and other drug use. The authors also assessed if attendance was associated with participation in substance abuse prevention activities, such as volunteering or donating money to organizations that target substance abuse prevention or treatment.

Study Outcomes

Results indicate that viewing the play increased participants' knowledge of substance abuse as a disease and increased their intent to participate in substance abuse prevention activities at home and in the community.

h The term "SUD" is used throughout this report in accordance with the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) definition published in 2013. When describing specific studies, many of which were published before 2013, the author's original language is used. In 2015, the International Society of Addiction Journal Editors recommended against using stigmatizing terminology, most notably "abuse" and "abuser," in published addiction science. For more information, see The International Society of Addiction Journal Editors, *Statements and Guidelines*, http://www.isaje.net/addiction-terminology.html

Follow-up surveys conducted three months after the play indicate that participants increased their participation in substance abuse prevention activities, particularly by donating money.[69]

The fact that the search resulted in only one study might suggest the following:

- SUD prevention programs that implement arts-based activities as part of their curricula do not emphasize the arts as the main "ingredient" or driver of outcomes.
- Arts-based prevention programs do not explicitly connect their program goals and activities to SUD prevention.
- Arts-based prevention programs do not measure and/or report outcomes related to SUD prevention.

Related Research

Several potentially promising programs—including prevention programs that do not explicitly target SUD but do target important risk and protective factors—fell outside the scope of this review. For example, participation in arts activities has been found to promote children's socioemotional development, resilience, and mental well-being[70, 71, 72]—all of which may protect against SUD.[73] Cultural arts programs have been found to support youth in the juvenile justice system in acquiring adaptive social, vocational, and emotional skills that foster self-esteem and self-efficacy and reduce interest in committing crimes.[74]

Similarly, creative youth development programs combine community arts education and positive youth development practices to foster life skills such as leadership, teamwork, and communication. Creative youth development programs have been found to positively impact academic outcomes, increase school engagement, and reduce the likelihood of school suspension.[75, 76]

Targeting risk and protective factors is one potential strategy that arts-based programs can use to support individuals at risk for OUD (*see Exhibit 6*).

Exhibit 6. Creative Youth Development Programs

Creative youth development programs blend art techniques with positive youth development practices to help young people build protective factors, achieve their goals, and transition to healthy, productive adulthoods. By establishing creative outlets for participants, program leaders hope to facilitate goal setting and positive decision-making that may help prevent youth SUD.

"It's like a marriage. We try to be as equal with our youth development as we are with our dance technique," says Charné Furcron, director of education for Moving in the Spirit. The Atlanta-based program offers youth dance classes with a focus on kinesthetic learning and nonverbal communication. For example, a teacher might ask students to perform movements that depict them turning down prescription opioids offered by their peers. The class might then transition into a reflection phase to discuss the feelings and thoughts they had while performing the movement.

In Albuquerque, New Mexico, the M3 program (shorthand for Movement + Mentorship = Metamorphosis) takes a similar approach to helping youth grow through dance and mentorship. The Keshet Dance Company delivers M3 to young people at the state-run juvenile detention facility. Mentors regard participants as fellow artists, not as inmates or juvenile delinquents, says founder and artistic director Shira Greenberg.

The Prodigy Cultural Arts Program in Tampa, Florida, serves some adjudicated youth but primarily delivers services at community-based sites across eight counties. The program offers dance, painting, photography, sculpting, music, theater, and more to deliver what director Mike Trepper calls "life skills–infused cultural arts."

"[Prodigy Cultural Arts Program] provides a variety of resiliency skills," Trepper says. "We're building self-confidence and encouraging goal setting and positive choice making ...all the ingredients that go into preventing young people from getting into a variety of issues, whether it's opioids or other substances."

Research Question 3. What is the evidence on the role of the arts in the treatment of SUD, including OUD?

The search process resulted in 36 studies on the topic of SUD treatment.

Study Characteristics

Most SUD treatment studies were conducted in the United States and evaluated a group music therapy intervention that treated participants at inpatient treatment centers. Music therapy sessions often involved lyric analysis, in which participants listened to a song and responded to questions from the music therapist about the song lyrics (e.g., "Line 14 reads: 'It took away my pain say please.' What are some ways to manage and cope with emotional and physical pain?"[77]).

Songwriting was another music therapy intervention studied in the articles included in the literature review. During songwriting, the music therapist encouraged dialogue by having participants compose song lyrics that relate to clinical objectives (e.g., writing a song about feelings of shame, guilt, and pride).[78] Exhibit 7 summarizes study characteristics.

Exhibit 7. Selected Characteristics of Substance Use Disorder Treatment Studies (*n* = 36)

Characteristic	Description	Number	Percentage	Notes
Location	United States	23	64	
	International	13	36	Common countries: United Kingdom (*n* = 2); Canada (*n* = 2)
Art form	Music	30	83	
	Other	6	17	Other art forms: literature (*n* = 1); psychodrama (*n* = 1); theater (*n* = 1); cinema (*n* = 1); other (*n* = 2)
Participation	Active	34	94	Common activities: lyric analysis (*n* = 8); songwriting (*n* = 5); drumming (*n* = 2)
	Passive	4	11	Activities: music listening (*n* = 3); cinema (*n* = 1)
Program format	Group	33	92	Common activities: group music therapy (*n* = 23)
Target population	Inpatient	24	67	Includes detox and/or residential treatment
	Outpatient	10	28	
	Court-mandated treatment	4	11	
Primary drug	Not specified SUD or polydrug	17	47	
	Alcohol	11	31	
	Opioid	5	14	

Note: Characteristics are not mutually exclusive.

Methodological Quality

Among the 18 studies using an RCT design, all missed the MMAT design criterion of blinding outcome assessors to the provided intervention. Because SUD treatment outcomes are typically measured through self-report, the participant is often the outcome assessor. And because participants typically know whether they received an art intervention, they are often not blinded to the intervention. If this item is excluded from the MMAT, 13 RCTs (72 percent) met all quality criteria. Second to blinding, the most frequently missed criteria were if randomization was appropriately performed and if groups were comparable at baseline. Exhibit 8 provides an overview of MMAT results.

Exhibit 8. Overview of Mixed Methods Appraisal Tool Results for Substance Use Disorder Treatment Studies (*n* = 36)

MMAT category	Number	Percentage	Percentage meeting all quality criteria for study design
Qualitative	2	6	50
Quantitative randomized controlled trials	18	50	0
Quantitative nonrandomized	9	25	45
Quantitative descriptive	2	6	50
Mixed methods	5	14	80

Note: By asking participants to self-report outcomes, all RCTs missed the design criterion of blinding outcome assessors to the provided intervention.

Study Outcomes

Studies most commonly measured outcomes related to mental health/well-being, such as depression, anxiety, anger, sadness, and guilt (*see Exhibit 9*). Of the 16 studies that fall into this category, eight (53 percent) reported statistically significant positive effects. Seven studies of music therapy, for instance, reported significant improvements in depression, anxiety, mood, and/or stress reduction.[79, 80, 81, 82, 83, 84, 85] Results for other art forms were less promising. One study, for example, investigated whether producing art (e.g., drawing, painting) or viewing art (e.g., sorting classical art prints) could reduce negative mood and anxiety for adults with SUD (*n* = 28). Although results indicated that negative mood and anxiety did decrease for the art production group, the reduction stemmed from time elapsed and not the intervention itself.[86]

Six music therapy studies measured outcomes related to treatment readiness and motivation, with four (67 percent) reporting statistically significant positive effects. A study of a lyric analysis intervention in a detoxification unit found that compared with participants in the control condition (*n* = 53), participants in the treatment condition (*n* = 51) had significantly higher problem recognition, desire for help, treatment readiness, and total motivation scores.[87]

Of the five studies that measured craving, three (60 percent; two music therapy, one music listening) reported statistically significant positive effects. One music listening study found that a combination of systematic desensitization and music can reduce craving in response to external cues more than standard treatment alone. Similar effects were observed whether participants listened to live music improvised on Tibetan bowls or relaxing music played on individual devices.[88]

Of the five studies (two music therapy, one drumming, one narrative therapy, one theater) that measured abstinence or drug use, all reported successful outcomes, but sample sizes were small and none were designed to test statistical

significance. Upon completion of a 12-week drumming program for American Indians/Alaska Natives with histories of SUD, participants (*n* = 5) reported continued sobriety or reductions in drug and/or alcohol use, but no follow-up was conducted.[89] A study of narrative therapy with adults aged 55–70 with addiction (*n* = 12) found that participants were able to reduce or halt their substance misuse over the course of an eight-week program, but no follow-up was conducted.[90]

Of the four studies that measured participant engagement/retention (one music therapy, one drumming, one cinema, one theater), three reported successful outcomes. None were designed to test statistical significance, however, because of small sample sizes. A seven-week trial of music therapy as a means of increasing engagement in an SUD treatment group found that participants (*n* = 24) were highly motivated to participate in group music sessions and enjoyed the sessions. Further analyses found that music therapy engaged participants regardless of their age group (under age 25 versus over age 25) or substance used (alcohol versus other drugs).[91]

Exhibit 9. Selected Outcomes of Substance Use Disorder Treatment Studies (*n* = 36)

Outcome	Measured		Statistically significant positive effect		Notes
	Number	Percentage	Number	Percentage	
Mental health/well-being	15	42	8	53	Includes depression, anxiety, anger, sadness, guilt, joy, hope, etc.
Readiness to change/ motivation	6	17	4	67	Includes readiness to change, treatment readiness, and motivation
Craving	5	14	3	60	
Abstinence/drug use	5	14	0	0	
Engagement/retention	4	11	0	0	
Working alliance	3	8	2	67	
Other	6	17	2	33	Includes emotional intelligence (n = 1), falling asleep (n = 1), locus of control (n = 1), self-concept (n = 1), self-efficacy (n = 1), and sharing of emotions (n = 1)

Note: Outcomes are not mutually exclusive; many studies measured multiple outcomes.

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Program Scan

A program scan was conducted to describe and highlight a range of programs that use the arts to address pain management or SUD prevention or treatment. This chapter summarizes key findings by research question, presents methods used in the program scan, and describes detailed results. It then presents summary profiles of the eight arts-based programs selected for inclusion in this report.

Overview of Key Findings

This section presents key findings by research question.

Research Question 1. What is the evidence on the role of the arts in pain management?

- Two of the four pain management programs included in the program scan reported statistically significant positive findings related to pain reduction.
- Arts-based programs target isolation and stigma among individuals with pain.

Research Question 2. What is the evidence on the role of the arts in the prevention of SUD, including OUD?

- Arts-based prevention programs included in the program scan do not measure or report outcomes related to the prevention of SUD.

Research Question 3. What is the evidence on the role of the arts in the treatment of SUD, including OUD?

- Three programs meeting inclusion criteria for the program scan address SUD in some manner, primarily through serving individuals with co-occurring SUD and other physical and mental health conditions.
- Arts-based programs from the program scan address social aspects of SUD, including improving community awareness of SUD and reducing stigma to promote resilience and recovery.

Methods

An initial list of candidate programs was generated through a search of electronic resources (i.e., federal agency websites, publication databases, and website search engines) using search terms such as "art therapy," "art education," "pain management," "SUD," and "OUD." The National Endowment for the Arts and technical working group (TWG)[i] members recommended additional programs for inclusion. These steps produced 50 program scan candidates.[j] Detailed methods can be found in appendix D.

i James Bell Associates convened a technical working group to help guide the review and/or identify programs and review key deliverables. See the acknowledgments section for a list of TWG members.

j The Arts Endowment limited the number of program scan candidates to no more than nine to ensure compliance with the Office of Management and Budget regulations regarding the Paperwork Reduction Act.

To be included in the scan, programs had to meet the following criteria:

1. The program was based on the arts or had prominent components that include the arts as reflected by explicit use of keywords in the program's title/name or published description;
2. The program centered on managing pain or preventing or treating SUD as reflected by explicit use of keywords in the program title/name or published description;
3. The program was active or recently implemented (i.e., within the past five years);
4. Evidence of program outcomes was available; and
5. The information needed to determine fit with eligibility criteria was publicly available.

Of the 50 programs considered, eight met the inclusion criteria (*see Exhibit 10*). Publicly available information for those programs was reviewed and abstracted. Program directors were contacted to ensure accuracy of the abstracted information and to learn more about the program components. Program profiles compiled from the information collected and confirmed through this process can be found at the end of this chapter. A list of programs excluded from the scan can be found in appendix E.

The programs in the scan are not intended to be examples of evidenced-based interventions. Instead, they are meant to illustrate a variety of interesting programs that use the arts to address pain management or SUD prevention or treatment. All programs included in the scan had some evidence related to program outcomes.[k] However, the scan did not review or assess the type or quality of the supporting methodological designs or review the programs against any evidence-based standards.

k Only one article from the program scan met the criteria for inclusion in the literature review: Ian J. Koebner et al., "The Art of Analgesia: A Pilot Study of Art Museum Tours to Decrease Pain and Social Disconnection among Individuals with Chronic Pain," *Pain Medicine* 20, no. 4 (2018): 681–91.

Exhibit 10. Programs Included in Scan

Program	Location	Description	Primary art form(s)	Relevant focus area(s)
Art Rx	Sacramento, California	Offers free guided gallery tours for individuals living with pain and their families and caregivers. https://health.ucdavis.edu/pain/acupuncture/CrockerArtRx.html	Visual art	Pain management
Cleveland Clinic Arts and Medicine Institute	Cleveland, Ohio	Integrates visual arts, music, performing arts, and research to promote healing and to enhance the lives of patients, families, visitors, and employees. https://my.clevelandclinic.org/departments/arts-medicine	Visual art and music	Pain management
M3 (Movement + Mentorship = Metamorphosis)	Albuquerque, New Mexico	Involves daily dance classes offered as part of the high school curriculum onsite at the state's juvenile detention facility. Students receive academic credit and learn literacy, math, science, and conflict resolution through dance to promote positive youth development and reduce juvenile incarceration. https://keshetarts.org/dance/social-justice-through-dance/#M3	Dance	SUD prevention
Moving in the Spirit	Atlanta, Georgia	Uses dance to teach young people social, emotional, and cognitive skills needed to thrive and avoid risk behaviors, including substance use. http://www.movinginthespirit.org/about-us/	Dance	SUD prevention
Porch Light	Philadelphia, Pennsylvania	Fosters health and wellness by providing opportunities for city residents, including those with SUD, to contribute to the production of public art murals. https://www.muralarts.org/program/porch-light/	Visual art	SUD treatment
Prodigy Cultural Arts Program	Tampa, Florida	Uses visual and performing arts to help young people develop life skills such as communication, leadership, anger management, career aspirations, and goal-setting to develop lifelong positive habits. http://www.uacdc.org/index.php/about-prodigy	Visual and performing arts	SUD prevention
Rural Veterans TeleRehabilitation Initiative Creative Arts Therapy Project	Gainesville, Florida	Provides creative arts therapies to veterans with various health and mental health conditions, often with co-occurring SUD, who may be isolated in rural areas. Participants engage with board-certified creative arts therapists via clinical video telehealth. https://blog.americansforthearts.org/2019/05/15/helping-veterans-build-connections-between-creative-arts-therapy-programs-and-their-local-arts	Visual art and music	Pain management and SUD treatment
Semper Sound	San Diego, California	Provides music therapy to military service members and veterans dealing with posttraumatic stress disorder, traumatic brain injury, and/or substance abuse. https://resoundingjoyinc.org/semper-sound/	Music	Pain management and SUD treatment

Results

This section presents results by research question.

Research Question 1. What is the evidence on the role of the arts in pain management?

Four programs that use the arts to treat and manage pain met criteria for inclusion in the program scan.

Program Characteristics

Three of the four pain management programs implement music or visual arts therapies delivered by certified therapists as their primary intervention(s). Two of those three programs also offer nontherapy arts activity components, such as viewing visual art or listening to music performances, in group or community settings. Group delivery facilitates the programs' goals of addressing isolation, social disconnection, and stigma associated with the experience of pain. For example, Art Rx emphasizes the importance of participants having positive experiences outside of medical or caregiving settings.

Populations served include veterans with traumatic brain injuries, posttraumatic stress disorder, health conditions, or SUD; individuals receiving inpatient or outpatient care in hospital settings; and individuals living with chronic pain. All four programs include options to engage families and caregivers. Exhibit 11 summarizes program characteristics.

Exhibit 11. Selected Characteristics of Pain Management Programs (*n* = 4)

Characteristic	Description	Art Rx	Cleveland Clinic Arts and Medicine Institute	RVTRI CAT	Semper Sound
Setting	Urban	√	√		√
	Rural			√	
Scope	One location	√			
	Multiple locations		√	√	√
Art form(s)	Art activities	√	√		√
	Visual art therapy		√	√	
	Music therapy		√	√	√
Program format	Individual		√	√	√
	Group	√	√		√

Another common program element is partnership between the arts and health communities. RVTRI CAT is funded, in part, by the U.S. Department of Veterans Affairs (VA) Office of Rural Health and encourages partnership between veterans and community artists and arts programs. Semper Sound has also forged a partnership with the VA. Both programs ensure veterans' access to visual art and music therapy rehabilitation services. Services are provided at VA hospitals and clinics, on military bases, and remotely.

Improving access to prevention, treatment, and recovery support services is one potential strategy that arts-based interventions can use to support individuals at risk for OUD *(see Exhibit 12)*.

Exhibit 12. Rural Veterans TeleRehabilitation Initiative Creative Arts Therapy

The RVTRI CAT project delivers virtual art, dance/movement, and music therapy to participants facing traumatic brain injuries, posttraumatic stress disorder, chronic pain, SUD, and other health issues. Participants include service members and veterans in northern Florida and southern Georgia with limited access to rehabilitation services.

Participants use two-way video to attend weekly, one-on-one sessions with registered and board-certified creative arts therapists. Using arts supplies and instruments delivered by the project, participants engage in activities such as drumming, painting, drawing, and creative writing.

Research on the RVTRI CAT project has illustrated veterans' progress in areas such as coping strategies, mindfulness, positive self-image, awareness of emotions, and nonpharmacological pain management.

"Veterans [say they are] more comfortable talking about things truthfully from their own homes. They don't worry about getting tearful or upset and then having to walk out of the VA hospital," says RVTRI CAT art therapist Heather Spooner.

RVTRI CAT is recognized by the VA as an Enterprise Wide Initiative, championing the expansion of telerehabilitation services to rural veterans. The initiative's creative arts therapies project continues to expand nationally with support from the VA's Office of Rural Health and the National Endowment for the Arts (Creative Forces).

Source: Heather Spooner et al., "Using Distance Technology to Deliver the Creative Arts Therapies to Veterans: Case Studies in Art, Dance/Movement and Music Therapy," *The Arts in Psychotherapy* 62 (2019): 12–18.

Program Outcomes

All four programs reported positive findings related to pain reduction (*see Exhibit 13*), and two of the four program findings were statistically significant.[92, 93] For example, the Cleveland Clinic Arts and Medicine Institute demonstrated that individuals with cancer who underwent autologous stem cell transplantation (i.e., a bone marrow transfusion procedure) and received music therapy used significantly less narcotic pain medication than those who did not receive the intervention.[94]

Two music therapy programs reported outcomes on mental health symptoms such as anxiety, stress, and depression. The Cleveland Clinic Arts and Medicine Institute found that participants experienced statistically significant reductions in anxiety and depression and improvements in mood, among other outcomes, after participating in music therapy sessions at the hospital.[95] Similarly, ongoing evaluation of participants in the Semper Sound music therapy program showed improvements on pre-/posttherapy session measures of pain, anxiety, stress, and depression, but significance testing was not conducted.[l]

l Unpublished findings from an internal evaluation report.

Three programs assessed the influence of arts activities on outcomes related to participants' sense of community, including reduced feelings of isolation. For example, Art Rx participants reported decreased feelings of social disconnection after attending gallery tours.[96]

Exhibit 13. Selected Outcomes of Pain Management Programs (*n* = 4)

Measured outcome	Art Rx	Cleveland Clinic Arts and Medicine Institute	RVTRI CAT	Semper Sound
Pain reduction/management	√[i]	√[ii]	√[iii]	√
Dosage/use of narcotic pain medication		√[iv]		
Sense of community, including reduced feelings of isolation and stigma	√[i]		√	√
Mental health symptoms, including mood, anxiety, stress, and depression		√[ii]		√

Sources: [i] Ian J. Koebner et al., "The Art of Analgesia: A Pilot Study of Art Museum Tours to Decrease Pain and Social Disconnection among Individuals with Chronic Pain," *Pain Medicine* 20, no. 4 (2018): 681–91; [ii] Debbie Bates et al., "Music Therapy for Symptom Management after Autologous Stem Cell Transplantation: Results from a Randomized Study," *Biology of Blood and Marrow Transplantation* 23, no. 9 (2017): 1567–72.; [iii] Heather Spooner et al., "Using Distance Technology to Deliver the Creative Arts Therapies to Veterans: Case Studies in Art, Dance/Movement and Music Therapy," *The Arts in Psychotherapy* 62 (2019): 12–18; [iv] Debbie Bates et al., "Music Therapy for Symptom Management after Autologous Stem Cell Transplantation: Results from a Randomized Study," *Biology of Blood & Marrow Transplantation* 23, vol. 9 (2017): 1567–72, doi:10.1016/j.bbmt.2017.05.015.

Targeting the psychological and social aspects of pain may be one potential strategy for arts-based programs to support individuals at risk for OUD (*see Exhibit 14).*

Exhibit 14. Art Rx

Art Rx aims to ease the burden of chronic pain through art appreciation and social engagement. Program docents lead participants on tours of the Crocker Art Museum in Sacramento, California, and facilitate discussions on the experience—how they feel looking at a particular piece of art—rather than the art object itself. "It's about connecting to other people and to the myriad aspects of the self that are not identified with the pain," says director Ian Koebner.

Art Rx engages health care practitioners in conversations about the value of the arts in pain management and partners with them to help support patients tapering off prescription opioids. The program also seeks to reduce the isolation of living with chronic pain by encouraging participants to bring guests on the tour, allowing them to assume the role of host with friends, families, and caregivers in a nonmedical setting.

Research on Art Rx has shown decreased feelings of social disconnection and pain unpleasantness among participants, who describe the program as a positive experience.

Research Question 2. What is the evidence on the role of the arts in the prevention of SUD, including OUD?

Three programs that use the arts to prevent SUD met inclusion criteria for the program scan.

Program Characteristics

All three prevention programs target youth, with M3 (Movement + Mentorship = Metamorphosis) serving incarcerated and paroled youth, and the other two programs serving youth in the community. All the programs provide dance classes. The Prodigy Cultural Arts Program offers additional art forms, such as painting, drawing, photography, sculpture, and music/orchestra.

Another common element is the infusion of youth development theory and practice into arts programming. The phases of Moving in the Spirit's dance program, for example, align with key youth development protective factors, including positive self-image. The Prodigy Cultural Arts Program ensures that staff artists are as equally skilled and trained in youth development practices as in the arts. Mentorship and lasting, long-term connections between staff artists and students are central elements of Keshet Dance Company's M3 program. Program characteristics are summarized in Exhibit 15.

Exhibit 15. Selected Characteristics of Substance Use Disorder Prevention Programs (*n* = 3)

Characteristic	Description	M3	Moving in the Spirit	Prodigy Cultural Arts Program
Setting	Urban	√	√	√
	Rural			√
Scope	One location			
	Multiple locations	√	√	√
Art form	Art activities	√	√	√
	Dance	√	√	√
	Visual arts			√
Program format	Individual	√		
	Group	√	√	√

Program Outcomes

Two of the three prevention programs do not measure substance use or substance use–related outcomes. However, they do assess important risk and protective factors related to SUD (*see Exhibit 16*). Academic achievements and behaviors were the most commonly measured outcomes. M3 found a 28 percent improvement in math, literacy, and science skills from semester to semester, on average, for students taking daily dance classes as part of the high

school curriculum at the state juvenile detention facility.[m] Significance testing was not conducted. Research on the Prodigy Cultural Arts Program has shown a positive influence on anxiety, withdrawal/depression, internalizing behaviors, aggressive behaviors, externalizing behaviors, social problems, and attention problems among youth served by the program.[97]

Two of the programs also assess important protective factors related to SUD. Third-year Moving in the Spirit participants were shown to score statistically significantly higher than first- and second-year participants on assessments of positive self-image. Program evaluations also revealed improvements in participants' confidence, empathy, resilience, and sense of belonging, among other factors.[n]

Moving in the Spirit was the only program to report on outcomes related to substance use. In the most recent program year, 97 percent of students indicated that the program helped them better avoid drug and gang activity. "Students are always responding positively on how they're able to become more involved in positive activities instead of using drugs," says Charné Furcron, director of education.

Exhibit 16. Selected Outcomes of Substance Use Disorder Prevention Programs (*n* = 3)

Measured outcome	M3	Moving in the Spirit	Prodigy Cultural Arts Program
Mental health symptoms, including mood, anxiety, stress, and depression		√	√[i,ii]
Behavioral dysregulation, including aggressive behaviors and conflict	√	√	√[i,ii]
Protective factors such as positive self-image	√	√[iii]	
Academic achievements	√	√	√
Juvenile justice involvement and recidivism	√		√
Substance use		√	

Sources: [i] Lisa Rapp-Paglicci, Chris Stewart, and William Rowe, "Improving Outcomes for At-Risk Youth: Findings from the Prodigy Cultural Arts Program," *Journal of Evidence-Based Social Work* 9, no. 5 (2012): 512–23; [ii] Tina Maschi et al., "An Evaluation of a Cultural Arts Program for Youth in a Juvenile Justice Program: Technical Report" (working paper, National Endowment for the Arts, New York, NY, 2013); [iii] Leon Rodgers and Charné Furcron, "The Dynamic Interface between Neuromaturation, Risky Behavior, Creative Dance Movement, and Youth Development Programming," *American Journal of Dance Therapy* 38, no. 1 (2016): 3–20.

Research Question 3. What is the evidence on the role of the arts in the treatment of SUD, including OUD?

None of the programs included in the scan self-identified as an SUD treatment program; however, three of the eight programs address SUD treatment in some manner. Co-occurring SUD was reported as prevalent among the populations served by Porch Light, RVTRI CAT, and Semper Sound. Participants had often experienced traumatic brain injury, posttraumatic stress disorder, or other physical and mental health conditions.

m Findings from unpublished evaluation reports

n Findings from unpublished evaluation reports

Porch Light creates murals focused on mental health, substance use, and other community issues to enhance resilience and recovery among individuals and to reduce social stigma and encourage empathy within the community.

RVTRI CAT and Semper Sound provide visual art therapies, music therapies, and other arts activities to veterans and military service members. Therapists and participants co-develop treatment plans based on participants' goals and areas of need, including SUD treatment. Exhibit 17 summarizes selected program characteristics.

Exhibit 17. Selected Characteristics of Substance Use Disorder Treatment Programs (*n* = 3)

Characteristic	Description	Porch Light	RVTRI CAT	Semper Sound
Setting	Urban	√		√
	Rural		√	
Scope	Multiple locations	√	√	√
Art form	Art activities	√		√
	Visual art therapy		√	
	Music therapy		√	√
Program format	Individual		√	√
	Group	√		√

Program Outcomes

The treatment programs identified in the scan have not assessed substance abstinence or use. However, the programs shared anecdotal successes related to SUD treatment. For example, Cory Woodrow, Semper Sound's director and music therapist, described a common refrain among clients who realized music can help them focus on recovery: "[A client will say], 'This is the first time I didn't think about alcohol. This is the first time I didn't think about substance use.'"

Mental health symptoms and behaviors such as aggression were the most commonly studied outcomes. Programs also assessed their influence on building a sense of community (*see Exhibit 18*).

Exhibit 18. Selected Outcomes for Treatment Programs (*n* = 3)

Measured outcome	Porch Light	RVTRI CAT	Semper Sound
Mental health symptoms, including mood, anxiety, stress, and depression	√	√[i]	√
Sense of community	√	√	√
Stigma associated with SUD	√		
Behavioral outcomes such as aggression, anger management, and awareness of emotion		√[i]	√

Source: [i] Heather Spooner et al., "Using Distance Technology to Deliver the Creative Arts Therapies to Veterans: Case Studies in Art, Dance/Movement and Music Therapy," *The Arts in Psychotherapy* 62 (2019): 12–18.

Program Profiles

This section presents summary profiles of the eight arts-based programs selected for inclusion in this report. Profiles are listed in alphabetical order by title of program. Descriptive details include the following:

- Background (e.g., year initiated/funded, locations, level/scope)
- Key stakeholders (e.g., implementing agencies, partnerships)
- Target populations
- Focus areas
- Core components and specific interventions
- Intended goals/outcomes
- Evidence/evaluation
- Program website

Art Rx

Program element	Details
Background	*Year initiated/funded:* October 2014 *Location(s):* Sacramento, California *Level/scope (e.g., state, county, community):* Implemented locally, but open to anyone who preregisters for an Art Rx gallery tour
Key stakeholders	*Funders:* California Arts Council (Research in the Arts Grant); National Center for Advancing Translational Sciences, National Institutes of Health, through grant number UL1 TR001860 and linked award KL2 TR001859; National Endowment for the Arts (Artworks) *Lead agency/implementer:* Integrative Pain Management Program within the Department of Anesthesiology and Pain Medicine at the University of California Davis *Partner(s):* Crocker Art Museum
Target population(s)	• Any individuals self-identifying as having chronic pain as well as their families and caregivers • Participants self-register for gallery tours
Focus area(s)	• Pain management (chronic pain) • Arts programming (visual arts) • Art museum and public health partnerships
Core components and specific interventions	• Free, docent-facilitated, one-hour gallery tours • Offered bimonthly at the Crocker Art Museum • Guided by a "slow art" model, tours concentrate on dialogue around two art objects preselected by the Art Rx museum docents, with the intent of focusing on quality interactions with art objects rather than on the quantity of objects viewed. • Emphasis is placed on the viewers' experience rather than the viewed objects (e.g., How does the viewer feel?).

Program element	Details
Intended goals/ outcomes	• To encourage positive experiences that reduce the burden of chronic pain and caregiver stress • To address isolation and social disconnection associated with chronic pain • To demonstrate the feasibility and benefits of partnerships between academic health centers and major art museums
Evidence/ evaluation	*Research question(s)/objective(s)* • Study 1: The objective was to examine the feasibility of art museum tours (Art Rx) as an intervention for individuals with chronic pain.[o] • Study 2: The objective was to describe the design and feasibility of a partnership between an art museum and an academic pain center (Art Rx) to address chronic pain.[p] *Study design(s) and participants* • Study 1: A single-group quasi-experimental mixed methods study analyzed survey data collected pre-Art Rx museum tour, immediately post-tour, and at three weeks post-tour (n = 54). In addition, 14 individuals (25 percent of study participants) were purposively sampled for semi-structured interviews. • Study 2: A qualitative descriptive study comprising key stakeholder interviews with participating healthcare providers and museum staff *Select findings* • Study 1: The intervention was found to be feasible. Of study participants, 57 percent reported pain relief during their tour, with an average pain relief of 47 percent on a scale of 0 to 100 percent. • Study 1: Study participants also reported statistically significant decreased feelings of social disconnection and pain unpleasantness pre- to post-tour. • Study 1: Participants who were interviewed indicated Art Rx was a positive and inclusive experience, with potential lasting benefit. For example, one participant is reported as having framed his experience as "building a skill" to use art appreciation and social engagement as analgesia. • Study 2: Results from interviews indicate both museum and healthcare providers view Art Rx as an innovative intervention, perceived as facilitating social connection, mitigating isolation, creating opportunities for learning, and offering a meaningful distraction from pain for individuals with chronic pain.
Website	**https://health.ucdavis.edu/pain/acupuncture/CrockerArtRx.html**

o For more information see Koebner et al., "The Art of Analgesia."

p For more information see Ian. J. Koebner et al., "Curating Care: The Design and Feasibility of a Partnership between an Art Museum and an Academic Pain Center," *Curator: The Museum Journal* 61, no. 3 (2018): 415–29.

Cleveland Clinic Arts and Medicine Institute

Program element	Details
Background	*Year initiated/funded:* 2008 *Location(s):* Cleveland Clinic is headquartered in Cleveland, Ohio, with enterprise locations across the United States and internationally. *Level/scope (e.g., state, county, community):* The Arts and Medicine Institute implements programming throughout the Cleveland Clinic enterprise, in multiple units on the main campus and at regional hospitals including Cleveland Clinic enterprise locations in Florida and Nevada.
Key stakeholders	*Funders:* Funded internally through the Cleveland Clinic as well as by donations and grants *Lead agency/implementer:* Cleveland Clinic *Partner(s):* Multiple community collaborators, including the Alzheimer's Association, Beck Center for the Arts, Cleveland Arts Prize, Cleveland Museum of Art, Credo, Dancing Wheels Company and School, Epilepsy Association, Museum of Contemporary Art Cleveland, and Roots of American Music, among others
Target population(s)	• Individuals of all ages receiving inpatient or outpatient care at a participating Cleveland Clinic location as well as their families, caregivers, medical staff, and visitors • For example, participating patients may be receiving care in the Children's, Heart and Vascular Institute units, Cancer Institute, transplant special care units, behavioral health units, and rehabilitation services, among others. • The program also targets the broader community to build connections between the arts, health, and medicine.
Focus area(s)	• Pain management • Creative arts therapies (art therapy and music therapy) • Arts programming (visual and performing arts) • Research and community building around the arts and healing
Core components and specific interventions	• Visual art and music therapy provided by board-certified therapists is offered as a complimentary service in inpatient and outpatient units and in various community programs. • Therapies are received based on referrals as well as on request. • Programs and groups are offered in select locations. • Therapy materials and interventions are chosen to correspond with the interests, physical condition, and goals of individual patients. • The Performing Arts Program and Visual Art Collections enhance the environment and Cleveland Clinic experience for patients and caregivers. Listeners are provided an opportunity to engage in high-quality performances by local musicians, with special events featuring dancers, ensembles, and local schools and arts organizations. Visual arts works are curated in public spaces. • Through a series of lectures, workshops, and presentations, people are given the opportunity to learn about the arts and the benefits of the arts.
Intended goals/ outcomes	• To enhance patients' experience at Cleveland Clinic through the arts • To assist with emotional and physical healing and growth • To build community around the arts, health, and medicine

Program element	Details
Evidence/ evaluation	Several studies have been completed in association with Cleveland Clinic's Arts and Medicine Institute.[q] Four are highlighted below. *Research question(s)/objective(s)* • Study 1: To examine the impact of art therapy sessions at the bedside[r] • Study 2: To understand the impact of music therapy sessions; identify common music therapy goals and interventions and assess their effect; and investigate the effects of gender, age, and type of cancer on symptoms in patients who experienced music therapy[s] • Study 3: To understand the impact of music therapy on post-elective orthopedic surgery patients' pain, mood, anxiety, nausea, use of narcotics and antiemetics, and length of stay[t] • Study 4: To determine the effect of music therapy among patients with lymphoma or multiple myeloma undergoing autologous stem cell transplantation (i.e., bone marrow transplantation)[u] *Study design(s) and participants* • Study 1: Retrospective chart review of patients who received an art therapy session and had documented pre and post ratings of mood, anxiety, and pain • Study 2: A retrospective study of data collected during music therapy sessions over 12 years. Patients scored pain, anxiety, depression, shortness of breath, and mood symptoms before and after sessions. Interventions were classified as music-assisted relaxation, music listening, verbal/emotional participation, verbal/cognitive participation, vocal participation, and physical participation. • Study 3: A randomized controlled study with an experimental arm (music therapy sessions) and a control arm (standard medical care). Data were obtained for 163 of the 200 randomized patients. • Study 4: A randomized controlled trial with an experimental arm (interactive music therapy; n = 37) and a control arm (no music therapy; n = 45) *Select findings* • Study 1: The results support the hypothesis that mood would be improved, and anxiety and pain reduced, after participation in an art therapy session at bedside. Choice of media, age, sex, or diagnosis did not significantly affect results. • Study 2: There was a positive and statistically and/or clinically significant effect on pain, anxiety, depression, shortness of breath, mood, facial expression, and verbalization outcomes from pre- to post-music therapy session (n = 293). • Study 2: Of patients, 96 percent had positive responses to participating in music therapy. Vocal and emotional interventions were determined to be the most effective intervention types in improving symptoms. Age, gender, and diagnosis had no impact on symptom improvement. • Study 3: In total, 73 percent of music therapy patients versus 41 percent of control patients reported improved pain (p < 0.001). No significant between-group differences in medications or length of stay were noted. Greater same-day improvements of pain, emotional status, and nausea were noted for patients who received music therapy sessions while hospitalized after elective orthopedic surgeries. • Study 4: Music therapy and control group patients had similar pain scores; however, the patients who received music therapy used significantly less narcotic pain medication (median, 24 mg versus 73 mg; p = 0.038).
Website	**https://my.clevelandclinic.org/departments/arts-medicine**

q More information on the breadth and depth of research is summarized in the Cleveland Clinic Art and Medicine Institute's 10-year anniversary retrospective newsletter, **https://my.clevelandclinic.org/-/scassets/files/org/arts-medicine/newsletter/2018-ami-newsletter.ashx?la=en**.

r For more information see Tamara A. Shella, "Art Therapy Improves Mood, and Reduces Pain and Anxiety When Offered at Bedside during Acute Hospital Treatment," *The Arts in Psychotherapy* 57 (2018): 59–64.

s For more information see Lisa M. Gallagher, Ruth Lagman, and Lisa Rybicki, "Outcomes of Music Therapy Interventions on Symptom Management in Palliative Medicine Patients," *American Journal of Hospice and Palliative Medicine* 35, no. 2 (2018): 250–57.

t For more information see Lisa M. Gallagher et al., "Impact of Music Therapy on Hospitalized Patients Post Elective Orthopedic Surgery: A Randomized Controlled Trial," *Orthopaedic Nursing* 37, no. 2 (2018): 124–33.

u For more information see Debbie Bates et al., "Music Therapy for Symptom Management after Autologous Stem Cell Transplantation: Results from a Randomized Study," *Biology of Blood & Marrow Transplantation* 23, vol. 9 (2017): 1567–72, doi:10.1016/j.bbmt.2017.05.015.

M3 (Movement + Mentorship = Metamorphosis)

Program element	Details
Background	*Year initiated/funded:* Keshet Dance Company has been developing its movement and mentorship program (M3) since 1996. *Location(s):* Albuquerque, New Mexico; expansion of the M3 model nationally through Keshet's Movement for Mercy program and New Mexico Arts & Justice Network (NMAJN). NMAJN is a statewide network launched by Keshet and community partners to support system-impacted youth within the full juvenile justice continuum via the arts. *Level/scope (e.g., state, county, community):* M3 is a statewide program. Through Movement for Mercy, the M3 movement-based model has been implemented in five pilot sites and continues to expand through NMAJN.
Key stakeholders	*Funders:* Funding for M3 has been provided by the United Way of Central New Mexico, Sheila Fortune Foundation, Sandia Foundation Grant, Andrew W. Mellon Foundation, and private donors. *Lead agency/implementer:* Keshet Dance Company (private, nonprofit organization) *Partner(s):* M3 partners include the New Mexico Children, Youth and Families Department; State Youth Detention Center; and Camino Nuevo Youth Center.
Target population(s)	• Incarcerated and paroling youth and young adults • Keshet reaches approximately 100 incarcerated New Mexico youth per year in the introductory and intermediate levels of M3 and approximately ten students per year in the advanced level of the program. • A broader target population will be served through NMAJN, including new partnerships with entities focused on behavioral health and substance use disorder.
Focus area(s)	• Prevention • Education • Youth development • Dance (art genres will diversify through NMAJN expansion)
Core components and specific interventions	• The M3 program has three stages—introductory, intermediate, and advanced. ○ During the introductory stage, dance is used to teach math, science, literacy, and conflict resolution skills within the high school on site at the State Youth Detention Center. The curriculum pairs a style of dance with an academic or social skill topic. Each unit uses movement to explore the subject matter. ○ Students completing the introductory classes move into the intermediate stage considered "pre-release." In this phase, programming is customized for each student to span the remainder of his or hertheir sentence (ranging from a few weeks to multiple years). ○ During the advanced stage, occurring upon parole/release, Keshet individually customizes a new track of programming to support the process of parole and reintegration. • A critical element of the M3 program is the consistent relationship between artists and students. M3 staff artists approach each student as a fellow artist, not as an inmate or juvenile delinquent. Emphasis is placed on the longevity of the relationship.

Program element	Details
Intended goals/ outcomes	• To teach incarcerated youth self-esteem, confidence, teamwork, and academics through dance • To reduce and eliminate juvenile incarceration and to replace systems of incarceration with systems of community mentorship
Evidence/ evaluation	Peer-reviewed, published studies have not yet been conducted of the M3 program. Keshet assesses academic outcomes by semester for participating students as well as occurrences of conflict incidences and recidivism rates as compared with nonparticipating youth inmates. These findings reflect ongoing averages: • Participating students demonstrate, on average, a 28 percent improvement rating on math, literacy, and science skills from semester to semester. • On an annual basis, participating students demonstrate, on average, a 20 percent reduction in conflicts with other inmates and staff compared with nonparticipating inmates. • M3 has seen a zero percent recidivism rate for students who complete all levels of the program as compared with the 50 percent juvenile recidivism rate within the state of New Mexico.
Website	https://keshetarts.org/dance/social-justice-through-dance/#M3

Moving in the Spirit

Program element	Details
Background	*Year initiated/funded:* Programming began in 1986 as an agency of FCS Urban Ministries; Moving in the Spirit became a separate nonprofit in 1996. *Location(s):* Atlanta, Georgia *Level/scope (e.g., state, county, community):* Implemented locally, but a student touring company provides performances across the country
Key stakeholders	*Funders:* Friends of Moving in the Spirit and private donors *Lead agency/implementer:* Moving in the Spirit *Partner(s):* Numerous partners, including local Boys & Girls Clubs, recreation centers, shelters and support services, schools, and the Rialto Center for Arts at Georgia State University
Target populations(s)	• Children and teens aged 3 to 18 years old, regardless of ability to pay • Moving in the Spirit serves over 250 youth annually. • On average, youth remain with Moving in the Spirit for seven years.
Focus areas(s)	• Prevention • Positive youth development • Arts programming (dance)
Core components and specific interventions	• Dance classes include Stepping Stones (open-level offering for youth aged 3 to 18), Men in Motion (boys aged 9 to 13), GLOW (Girls Leading Our World) in Motion (girls aged 9 to 13), Apprentice Corporation intensive training program (youth aged 13 to 18), Student Touring Dance Company for advanced students, and summer camps for youth aged 8 to 13. • The curriculum focuses primarily on modern dance and incorporates ballet technique, creative movement, and the creation of original choreography. Emphasis is placed on nonverbal communication and kinesthetic learning. • Students have a voice in class and choreography, set personal goals, problem-solve with peers, and practice leadership skills. • Youth development best practices are integrated into all class structures. For example, dance classes have five phases that align with and support the five protective factors outlined in the Strengthening Families Protective Factors Framework.[v]
Intended goals/ outcomes)	• To help children and teens develop the social, emotional, and cognitive skills they need to thrive • To create opportunities for youth who otherwise lack access to after-school enrichment programs, especially those focused on the arts

v For more information on the Protective Factors Framework, see the Center for the Study of Social Policy's website at https://cssp.org/our-work/projects/protective-factors-framework/.

Program element	Details
Evidence/ evaluation	*Research question(s)/objective(s)* • Study 1: Does length of participation in an inner-city youth dance program help young people avoid risky behavior and acquire competence in essential life skills?[w] • Internal monitoring and evaluation efforts assess key outcomes of interest throughout the program year and over time. *Study design(s) and participants* • A quasi-experimental study was conducted through which the Piers-Harris Children's Self-Concept Scale (Piers-Harris 2), a widely used measure of psychological health, was administered to participants for three consecutive years (n = 17). • To assess key outcomes throughout the program year, Moving in the Spirit uses and analyzes data from the Pro-Social Checklist, Piers-Harris 2 Self Concept Test, Developmental Assets Profile, and a Modern Dance Technique Assessment. Youth feedback is also collected through self-report participant surveys. *Select findings* • Third-year participants scored significantly higher than first- and second-year participants on physical appearance and attributes (corresponding to the program's youth development goal of positive self-image). • Ongoing program evaluation has revealed the following: ○ Youth show significant improvement in youth development goals, including confidence, empathy, resilience, conflict management, behavioral and intellectual competency, and sense of belonging, as measured by standardized assessments. ○ In the 2018 program year, students stated that Moving in the Spirit helped them improve in avoiding drug and gang activity (97 percent), setting personal goals (98 percent), expressing anger without violence (99 percent), and working hard in school (93 percent). ○ Over the past ten years, 100 percent of Moving in the Spirit participants have graduated high school and gone on to college, vocational school, or military careers.
Website	**http://www.movinginthespirit.org/**

w For more information, see Leon Rodgers and Charné Furcron, "The Dynamic Interface between Neuromaturation, Risky Behavior, Creative Dance Movement, and Youth Development Programming," *American Journal of Dance Therapy* 38, no. 1 (2016): 3–20.

Porch Light

Program element	Details
Background	*Year initiated/funded:* 2007 *Location(s):* Philadelphia, Pennsylvania *Level/scope (e.g., state, county, community):* Implemented locally
Key stakeholders	*Funders:* Private contributions account for 50 percent of the annual expenses. The main funder of the program is the City of Philadelphia's Department of Behavioral Health and Intellectual disAbility Services. *Lead agency/implementer:* City of Philadelphia Mural Arts Program and Mural Arts Advocates in joint collaboration with the City of Philadelphia's Department of Behavioral Health and Intellectual disAbility Services *Partner(s):* As of 2017, current partners include Veterans Empowerment Center, New Kensington Community Development Corporation, Impact Services Inc., Prevention Point Philadelphia, The Kirkbride Center, North Philadelphia Health Systems, Children's Crisis Treatment Center, New Life Recovery and Learning Center, and Einstein Healthcare Network Long-Term Structured Residence, among others.
Target population(s)	• Persons dealing with behavioral health conditions
Focus area(s)	• Behavioral health • Trauma • Substance use recovery • Community • Refugees and immigrants • Homelessness
Core components and specific interventions	• Participatory mural-making by teams of people with and without behavioral health conditions, often in distressed neighborhoods, through two-year partnerships with behavioral health provider sites • Three community storefront locations where a variety of arts programming is used to address community needs, including immigration, housing, and substance use • Year-round workshops, arts programming, community meetings, health forums, and paint days offered through provider sites and storefronts • A central theme to the program's work is the importance of having a safe and inviting space to come home to in the darkness (i.e., a porch light). Hence, the program's name symbolizes the explicit intent to create safe havens throughout the city where people can find shelter from mental and emotional challenges. • Social justice, health equity, and social change through participatory public artmaking
Intended goals/ outcomes	• To improve individuals' health by increasing access to resources (such as behavioral health and social services); reducing personal stigma; and developing skills to enhance resilience and recovery (such as social skills, self-expression, esteem building, problem-solving, abstract thinking, or skills related to making art) • To improve the community's health by promoting community and social inclusion, reducing social stigma of behavioral and mental health conditions, improving the neighborhood physical and social environments, and promoting community connectedness • To improve public health by increasing awareness about mental health and wellness, increasing attention to social determinants of health, promoting collective self-efficacy in a neighborhood, and using art as a catalyst for individual and social change

Program element	Details
Evidence/ evaluation	Several studies of the Porch Light program have been completed.[x] Four are highlighted below. *Select research question(s)/objective(s)* • Study 1: Can group-based, participatory mural- making improve health outcomes and reduce stigma among individuals in treatment for a significant behavioral health condition? [y] • Study 2: To identify individual mechanisms of change that result from participating in group-based, participatory mural- making for individuals in treatment for a significant behavioral health condition.[z] • Study 3: To describe the impact of a participatory public mural-making process focused on suicide that was intended to help community members heal and to stimulate a community mobilization initiative to prevent suicide. [aa] *Study design(s) and participants* • Study 1: A comparative outcome trial was used to compare health outcomes and stigma reported by 264 individuals receiving treatment in three pairs of behavioral health clinics matched on key characteristics of service recipients. • Study 2: This study completed in-depth, follow-along qualitative interviews with ten individuals who engaged in group-based, participatory mural- making over a six- to 12-month period. • Study 3: This qualitative case study used seven brief, first-person accounts to describe the impact of this initiative. The accounts were from leaders of three sponsoring agencies, the lead muralist, a suicide researcher, and two community members who are suicide survivors. *Select findings* • Study 1: After almost two years, residents living within one mile of more than one newly installed mural reported a sustained increase in collective efficacy, including social cohesion and trust among neighbors as well as informal neighborhood social control, and a sustained decrease in stigma toward individuals with mental health or substance abuse challenges. • Study 1: Overall comparisons of outcomes did not significantly differ across sites, but when attendance and implementation at mural-making clinic sites were taken into account, individuals who participated in mural- making reported less stress and reduced behavioral health stigma. • Study 2: Focusing on two case studies for illustrative purposes, four potential mechanisms of change were identified that result from participation: (1) increased friendship, (2) an enhanced sense of self, (3) a desire to give back to one's community, and (4) increased hope for the future. • Study 3: First-person accounts provided encouraging evidence of individual and community healing, social connectedness, and reduced feelings of stigma. The project also demonstrated the feasibility of using participatory public art as a basis for mobilizing large and diverse groups of community participants in a suicide prevention initiative.
Website	**https://www.muralarts.org/program/porch-light/**

x Published studies to date have focused on the provider site's component of Porch Light's programming. An updated list of publications for this project can be found at **https://medicine.yale.edu/psychiatry/consultationcenter/**.

y For more information see Jacob K. Tebes et al., *Porch Light Program: Final Evaluation Report* (New Haven, CT: Yale School of Medicine, 2015), **https://medicine.yale.edu/psychiatry/consultationcenter/Images/Porch_Light_Program_Final_Evaluation_Report_Yale_June_2015_Optimized_tcm798-218966.pdf**.

z For more information see Nathaniel V. Mohatt et al., "From Recovery-Oriented Care to Public Health: Case Studies of Participatory Public Art as a Pathway to Wellness for Persons with Behavioral Health Challenges," *Journal of Psychosocial Rehabilitation and Mental Health* 2, no. 1 (2015): 9–18.

aa For more information see Nathaniel V. Mohatt et al., "A Community's Response to Suicide through Public Art: Stakeholder Perspectives from the Finding the Light Within Project," *American Journal of Community Psychology* 52, no. 1–2 (2013): 197–209.

Prodigy Cultural Arts Program

Program element	Details
Background	*Year initiated/funded:* 2000 *Location(s):* Tampa, Florida *Level/scope (e.g., state, county, community):* The program is offered in eight counties in west central Florida through subcontracted organizations. It has a mobile component, Prodigy Moves!, that takes mobile cultural arts classrooms to underserved students in high-risk neighborhoods across these counties, including within students' housing communities and apartment complexes.
Key stakeholders	*Funders:* University Area Community Development Corporation, Department of Juvenile Justice, and private donors *Lead agency/implementer:* Prodigy Cultural Arts *Partner(s):* The Orlando Neighborhood Improvement Corporation, The Florida Museum of Photographic Arts, the Florida Orchestra, the University Area Community Development Corporation, Tampa Housing Authority, Girls Inc., local Boys & Girls Clubs, local YMCA chapters, and local schools, among others
Target populations(s)	• Youth aged five5 to 18 years old (the program has a history of servicing at-risk youth and youth who have been adjudicated in the juvenile justice system) • Prodigy has served more than 28,000 youth.
Focus areas(s)	• Prevention • Positive youth development • Life skills-–infused cultural arts • Arts programming (visual and performing arts)
Core components and specific interventions	• Eight-week-long visual and performing arts classes taught by master artists at no cost to participants • Curriculum and ages served vary by location. Program fidelity is assessed using performance measures. • Prodigy teaches core self-regulation skills, including anger management, problem-solving, and communication. • Classes are designed to explore and creatively express thoughts, feelings, and values. Each class focuses on a specific life skill (e.g., anger management) and connects it to the art.
Intended goals/ outcomes	• Prodigy uses visual and performing arts as a way to help young people develop life skills, build self-confidence, and develop lifelong positive habits for future success.

Evidence/ evaluation	*Research question(s)/objective(s)* • Study 1: To evaluate the Prodigy Cultural Arts Program as an early prevention program for adjudicated youth [ab] • Study 2: To examine the impact of Prodigy on social skills and mental health outcomes [ac] *Study design(s) and participants* • Study 1: A quasi-experimental pre- and posttest study among 140 adolescents served by the program (8 to 18 years old, with a mean age of 16; 53 percent boys and 47 percent girls; 77 percent of youth were adjudicated by the state juvenile system). Outcome measures included assessments of mental health, social skills, behavioral skills, and family functioning. • Study 2: A wait-listed comparison group design with pre- to post-assessments of mental health, social skills, and behavioral measures. Participants included 53 youth in the treatment group and 32 in the comparison group, with mean ages of 14.9 and 12.6, respectively. *Select findings* • Study 1: Significant reductions were seen in mental health symptoms (particularly for females) and behavioral dysregulation (particularly for males). Specifically, youth showed reduction in anxiety, withdrawal/depression, internalized behaviors, aggressive behaviors, externalizing behaviors, social problems, and attention problems. Significant increases in academic performance and family functioning were also found. [ad] • Study 2: Modest effects on social skills and mental health outcomes were reported, with more impact on females than males. Overall, program participants showed positive trends in reduction of aggressive behavior and behavioral dysregulation, and increased social problem-solving. • Program monitoring findings demonstrate that 95 percent of youth enrolled do not have contact with law enforcement and for those who have committed a minor offense, over 89 percent do not reoffend.
Website	**https://www.uacdc.org/index.php/about-prodigy**

ab For more information see Lisa Rapp-Paglicci, Chris Stewart, and William Rowe, "Improving Outcomes for At-Risk Youth: Findings from the Prodigy Cultural Arts Program," *Journal of Evidence-Based Social Work* 9, no. 5 (2012): 512–23.

ac For more information see Tina Maschi et al., "An Evaluation of a Cultural Arts Program for Youth in a Juvenile Justice Program: Technical Report" (working paper, National Endowment for the Arts, New York, NY, 2013), **https://www.arts.gov/sites/default/files/Research-Art-Works-Fordham1.pdf**.

ad Findings are supported by earlier published evaluations demonstrating similar outcomes for the program. For more information see Lisa Rapp-Paglicci, Chris Stewart, and William Rowe, "Can a Self-Regulation Skills and Cultural Arts Program Promote Positive Outcomes in Mental Health Symptoms and Academic Achievement for At-Risk Youth?," *Journal of Social Service Research* 37 (2011): 309–19; and Chris Stewart, Lisa Rapp-Paglicci, and William Rowe, "Evaluating the Efficacy of the Prodigy Prevention Program across Urban and Rural Locales," *Child and Adolescent Social Work Journal* 26 (2009): 65–75.

Rural Veterans TeleRehabilitation Initiative Creative Arts Therapy (RVTRI CAT)

Program element	Details
Background	*Year initiated/funded:* The Rural Veterans TeleRehabilitation Initiative (RVTRI) was established within the North Florida/South Georgia Veterans Health System in 2009. Art and dance/movement therapy were added in 2014 and in 2017 the program began offering music therapy through a partnership with Creative Forces: National Endowment for the Arts Military Healing Arts Network. *Location(s):* The primary catchment area for the RVTRI CAT project is the territory of the North Florida/South Georgia Veterans Health System (NF/SG VHS). Three new expansion sites beyond NF/SG VHS are being added and are expected to begin operations. *Level/scope (e.g., state, county, community):* RVTRI is an Enterprise-Wide Initiative of the Veterans Affairs (VA) Office of Rural Health. Current expansion includes three new sites offering creative arts therapy services for veterans in Ohio, Indiana, and Mississippi.
Key stakeholders	*Funders:* VA Office of Rural Health, National Endowment for the Arts (Creative Forces), and Americans for the Arts *Lead agency/implementer:* North Florida/South Georgia Veterans Health System and Rural Veterans TeleRehabilitation Initiative *Partner(s):* University of Florida's Center for Arts in Medicine
Target population(s)	• Veterans and some qualifying active duty service members throughout North Florida or South Georgia are referred by their VA providers. • Referrals are most often made for veterans with traumatic brain injury (TBI), posttraumatic stress disorder (PTSD), various physical health conditions, chronic pain, and substance use disorders. • Participants live an average of 93 miles away from a VA health facility.
Focus area(s)	• Rehabilitation • Mental health • Pain management • Substance abuse treatment • Creative arts therapies (art therapy, dance/movement therapy, music therapy)
Core components and specific interventions	• RVTRI CAT engages veterans in creative arts therapy sessions with board-certified creative arts therapists via real-time, two-way video (i.e., clinical video telehealth). • Participants generally attend an initial visit in person at the NF/SG Veterans System's Medical Center and then receive six to eight weekly individual telehealth sessions. A hybrid of the model allows veterans to participate primarily in person, primarily via telehealth, or through a combination of delivery methods. • Treatment plan goals are developed collaboratively by veterans and their creative arts therapists with consideration for the reason for referral and assessment results. • Assessments include the Formal Elements Art Therapy Scale, World Health Organization Quality of Life Scale Brief Version, Positive and Negative Affect Schedule-Expanded Form, and the Montreal Cognitive Assessment.

Program element	Details
Intended goals/ outcomes	• To enable access to high-quality rehabilitation services for rural veterans • To deliver rehabilitation services to rural veterans using encrypted in-home, live-streaming video • To promote psychological and emotional health among participants, including improved interpersonal and communication skills; management of difficult emotions; reduced depression, stress, and anxiety; and improved cognition, memory, sensory-motor function, impulse control, concentration, and sleep • To promote autonomy and independence in the assimilation process of active duty to veteran status • To improve participation, activity, and community integration
Evidence/ evaluation	*Research question(s)/objective(s)* • Study 1: To document and describe the RVTRI CAT creative arts therapy practice [ae] • Study 2: To illustrate how creative arts therapies telehealth is delivered and how telehealth can be applied across different demographics, as well as to demonstrate some of the challenges and opportunities for creative arts therapists delivering services via telehealth [af] *Study design(s)* • Study 1: At the time of the study, the program had received referrals for 113 outpatient veterans, of which 69 percent completed an initial evaluation and 78 percent of those completed at least one follow-up session. Of therapy sessions, 58 percent took place via telehealth. Program insights were drawn from interviews with participating veterans who conducted at least 50 percent of their sessions via telehealth. • Study 2: Three case studies were presented of veterans who received either art therapy, dance/ movement therapy, or music therapy via in-home, synchronous clinical video telehealth. *Select findings* • Study 1: Feedback from program participants suggests RVTRI CAT fills a much-needed gap for veterans by providing consistent in-home care between face-to-face visits. • Study 2: The three case studies demonstrate the potential and feasibility of delivering creative arts therapy via telehealth. Case study participants reported making progress toward individualized goals, including developing improved coping strategies, increasing mindfulness, promoting a more positive self-image, being more aware of emotions, improving pain management, and increasing physical mobility. • Study 2: When familiarity and comfort are established with technology, it can become a tool for veterans who are geographically isolated to address other challenges and barriers in their transition to a meaningful and engaged civilian life. One area of significant potential with telehealth is the possibility for it to be used as a bridge between clinical care and community integration.
Websites	**https://blog.americansforthearts.org/2019/05/15/helping-veterans-build-connections-between-creative-arts-therapy-programs-and-their-local-arts**
	https://www.kpbs.org/news/2018/may/09/new-va-telehealth-program-brings-art-therapy-vets-/

ae For more information see Charles E. Levy et al., "Telehealth-Based Creative Arts Therapy: Transforming Mental Health and Rehabilitation Care for Rural Veterans," *The Arts in Psychotherapy* 57 (2018): 20–26.

af For more information see Heather Spooner et al., "Using Distance Technology to Deliver the Creative Arts Therapies to Veterans: Case Studies in Art, Dance/Movement and Music Therapy," *The Arts in Psychotherapy* 62 (2019): 12–18.

Semper Sound

Program element	Details
Background	*Year initiated/funded:* Resounding Joy Inc. has been providing supportive music and music therapy since 2005. The Semper Sound Military Music Therapy Program was established in 2010. *Location(s):* San Diego, California *Level/scope (e.g., state, county, community):* Implemented locally at military bases, veterans' facilities, and the Resounding Joy Music Wellness Center. Semper Sound also operates satellite military music therapy services at the Soldiers' Home in Chelsea, Massachusetts.
Key stakeholders	*Funders:* Resounding Joy, grants (from foundations and government agencies such as the California Arts Council), individual donors, and military/veteran facilities *Lead agency/implementer:* Resounding Joy Inc. *Partner(s):* Semper Sound partners with a number of local service facilities in the San Diego area, including the San Diego Veterans Affairs Medical Center and Naval Medical Center San Diego.
Target population(s)	• Military service members and veterans of all ages diagnosed with PTSD, TBI, substance abuse, and other stress- and trauma-related physical and psychological conditions • Semper Sound provides music therapy to hundreds of active, limited duty, and retired service members and their families annually. • The program reaches thousands of community members each year through public performances by the Semper Sound Band and other music programming events.
Focus area(s)	• Service member and veteran rehabilitation • TBI and PTSD • Pain management • Creative arts therapy (music therapy) • Community music programming
Core components and specific interventions	• Identified as a model program by the American Music Therapy Association, Semper Sound provides impact through three tiers of services and supports: (1) music therapy curriculum, (2) supportive music services, and (3) community music programming. • Semper Sound music therapists have additional training in neurologic music therapy, which addresses TBI and other relevant diagnoses in the military community. • Semper Sound music therapists use a variety of music-based interventions, such as interactive music- making, songwriting, therapeutic instrument instruction, lyric analysis, guided relaxation music, and improvisation. • Individual and group sessions focus on clients' symptom management, creativity, achievement of goals, and developing insight into one's own abilities and personality. • Semper Sound's Peer-Support Model encourages music therapy participants and local veteran musicians to connect through Semper Sound Band. The band was created to ensure continuity from clinic to community, to support military transition and reintegration, and to reinforce therapeutic goals. • In 2018, Resounding Joy and other nonprofits secured a grant to host Pop-Up Community Creative Arts Cafés in various locations across San Diego County. The cafés are designed to bridge the gap between residents and the area's military community, introduce service members to an array of art, and provide information to military personnel about services and programs available to them.

Program element	Details
Intended goals/ outcomes	• Clients learn to use music as a coping skill to manage anger, anxiety, and physical/ emotional pain from PTSD, TBI, and other diagnoses. • Clients increase their awareness and insight of self and others. • Clients gain communication skills.
Evidence/ evaluation	Published research on the Semper Sound program has not yet been conducted. Resounding Joy uses per-session outcomes and reviews patient and staff surveys and testimonials to internally evaluate the success of the Semper Sound program. • Between January and September 2019, program participants showed improvements in pain, anxiety/stress, anger, and depression outcomes from pre-session to post-session. Specifically, clients reported an average decrease in pain of 17.02 percent, a 40.26 percent improvement in anxiety/stress, a 38.40 percent reduction in depression, and a 55.21 percent improvement in anger. During the period, Semper Sound had 511 unduplicated contacts with service members/veterans. • Veterans share positive testimonials of their experience receiving music therapy sessions and participating in the Semper Sound Band, including that the programming helped them cope with anger management issues and anxiety, helped them feel bonded to others and have a sense of community, and improved their physical mobility through activities such as learning to play the piano.
Website	https://resoundingjoyinc.org/semper-sound/

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Evidence Gaps and Limitations: Moving Forward

This chapter identifies limitations to the studies included in this report, limitations to the report itself, and evidence gaps. To address these gaps, a number of directions for future research are recommended.

Study Limitations

The most common limitation of the studies included in this report was small sample size, especially for studies on SUD. Small sample sizes could stem from insufficient or lack of funding; only 43 percent of pain management studies and 31 percent of SUD treatment studies identified a funding source. Many studies relied on small convenience samples, introducing several potential confounding factors (e.g., selection bias). Small sample sizes also limit statistical power and preclude the examination of subgroup differences to gauge if interventions worked differently for different groups of people (e.g., men versus women, participants with alcohol use disorder versus OUD).

Most research was conducted within clinical settings—either postoperative hospital units or inpatient treatment units—limiting the generalizability of the findings to other settings. The studies' focus on clinical settings also limited the intervention dosage, typically to single sessions for interventions offered in postoperative hospital and inpatient detoxification units. Likewise, few studies assessed the maintenance of outcomes over time.

In some cases, investigators served as both clinician and researcher by facilitating therapy sessions and administering outcome assessments. This dual role introduces response bias.

Finally, missing information from articles made it difficult to collect study characteristics. For example, it was difficult to distinguish between a music therapy intervention, which requires a credentialed professional[ag] who has completed an approved and accredited music therapy program, and a nonsystematic music medicine or music-listening program. Most studies did not report credentialing details, and many were conducted in different countries with varying credentialing standards. As the field of arts and health advances, the need is growing for arts professionals to develop and follow professional standards of practice that ensure patient safety and avoidance of harm.[98]

Likewise, many music studies did not report details such as the type of music used, whether music was selected by participants or researchers, the names of musical pieces, or the music structure and characteristics. There has been a call in the literature to include clear and detailed explanations of the interventions used and why that intervention was selected.[99]

Finally, most studies did not report an effect size, making it difficult to understand the magnitude of the differences found.

ag In contrast to other arts professionals, such as artists, performers, or artists in residence, certified creative arts therapists are fully trained as artists and therapists. They have typically completed graduate study and should be board-certified, registered, and/or licensed by their corresponding creative arts therapy certification board. They must comply with discipline-specific clinical practice standards and codes of ethics and must meet continuing education requirements to maintain professional credentials. For more information, see Patricia Dewey Lambert and Jill Sonke, "Professionalizing Arts Management in Healthcare Facilities," *The Journal of Arts Management, Law, and Society* 49, no. 3 (2019): 155–70, doi:10.1080/10632921.2018.1559264.

Report Limitations

All literature reviews are subject to publication bias (i.e., the failure to publish study results because of the direction or strength of the findings).[100] When journals publish only statistically or clinically significant results, they impact the conclusions of a literature review and consequently the information presented to researchers, health care providers, and policymakers.[101]

For this report, publication database searches were limited to peer-reviewed sources. Because music is the most prevalent art form in the peer-reviewed literature,[102] this approach may have limited the number of studies on arts-based interventions other than music, such as visual arts or writing. A systematic search of white or gray literature, such as unpublished dissertations or theses, was not conducted, but white and gray literature identified through backward and forward reference searches (i.e., by following chains of citations and sources identified in the initial search) was reviewed.

In addition, while the search used a combination of Medical Subject Headings (MeSH) searching, keyword searching, and text word searching, searches were refined by limiting text word searching to titles only. This was done to ensure a more focused and relevant search. This means, however, that if an article included one of the search terms in the text but did not include that term as a MeSH heading, as a keyword, or in the article title, it would not have been picked up by the search.

An integrative literature review, not a meta-analysis, was conducted. While this report describes the direction of the reported effects (i.e., positive or negative), it does not assess effectiveness of a specific intervention or examine differences between different types of interventions.

Finally, program scan information in the report relies largely on informal conversations with program representatives and is exploratory in nature. Only programs with publicly available resources were identified for inclusion.

Directions for Future Research

Findings and limitations of the literature review and program scan were used to identify directions for future research. This section offers suggestions by research question.

Research Question 1. What is the evidence on the role of the arts in pain management?

More studies should assess the maintenance of benefits from arts-based pain management treatment over time. More than half the studies in the literature review took place in a hospital setting and assessed participants during the immediate postoperative period. Few studies followed up with participants after they left the hospital. One study of participants with chronic pain (including lumbar pain, fibromyalgia, inflammatory disease, or neurological disease) found that those who participated in music intervention sessions while hospitalized (n = 44) experienced an improvement in their pain level double than that seen in the control group (n = 43); this significant effect on pain was sustained for up to one month posthospitalization.[103] Future studies should examine if postoperative, arts-based interventions can prevent the development of chronic pain and disability and/or chronic opioid use and OUD. Long-term follow-up studies should also examine dosage effects and the cost effectiveness and/or cost benefit of music interventions. Additional funding is needed to support these efforts.

Additional research is needed on the impact of arts-based interventions in non-hospital settings. While more than half the studies in the literature review took place in a hospital setting, the program scan identified arts-based programs implemented in community-based locations and the home. Semper Sound has the potential to offer home visits with board-certified music therapists, for example, and RVTRI CAT offers creative arts therapies using clinical video telehealth (i.e., real-time, two-way video chat). Such programs can engage participants for whom distance or disability limits accessibility to available rehabilitation services and resources and allow for long-term programming and follow-up, but more research is needed to strengthen their evidence base. Future research should also examine the impact of arts-based interventions that link clinical and community settings.

Future studies should examine the impact of arts-based interventions other than music. Only a handful of studies examined the impact of arts-based interventions other than music, and most had small sample sizes. One study of individuals with chronic low back pain (n = 30) found that participation in aerobic dance resulted in statistically significant positive effects on pain intensity, functional disability, and quality of life.[104] Another study found that a literature-based intervention had a positive effect on the pain and psychological well-being of participants (n = 6) suffering from chronic pain, but it did not test statistical significance.[105] Additional research is needed to inform the evidence base.

There is a need for additional research on the impact of arts-based interventions on chronic pain. Chronic pain is the most prevalent public health condition in the United States, affecting an estimated 20 percent of adults,[106] yet only 31 percent of the reviewed studies targeted individuals with chronic pain. Those studies that did examine chronic pain found mostly positive effects. Participants (n = 37) with fibromyalgia who were asked to listen to 25 minutes of researcher-selected music twice a day for 14 days reported a statistically significant decrease in pain between days one and 14 compared with control participants who did not listen to music.[107] These and other, similar results suggest that music interventions can be an effective treatment option for individuals with chronic pain.

Future studies should consider using qualitative information to contextualize quantitative findings. Quantitative data from a mixed methods study found that music listening and music therapy interventions were equally effective in reducing pain in individuals with cancer (n = 31). Some participants in the same study revealed that listening to music evoked intense memories of loss and trauma.[108] These qualitative findings provide a more nuanced understanding of treatment effects, indicating a potential need for psychotherapeutic support for patients coping with intense emotions.

Additional research is needed on the impact of arts-based interventions on the social aspects of pain management. The program scan found that, in addition to targeting physical pain, arts activities and therapies also target the psychological and social aspects of pain by emphasizing community-building around the arts and pain management for individuals, families, medical caregivers, and researchers. Anecdotes offered by Art Rx and others suggest the arts' promise in addressing social stigma related to pain and helping individuals feel less isolated by their pain.

Future studies should examine arts-based interventions compared with and combined with standard care (e.g., pain medication) and other nonpharmacological treatments (e.g., acupuncture, massage therapy). One study examining the impact of massage alone (n = 13), massage with music (n = 13), music alone (n = 13), and standard care (n = 13) on participants' anxiety and consumption of pain medicine found no significant differences between groups.[109] Additional research is needed to inform the evidence base and to help inform which pain management strategies yield the best outcomes.

There is a need for research to examine the mechanism of action in arts-based interventions. Music has been shown to influence activity in the medial prefrontal cortex and limbic/paralimbic brain structures involved in affective and cognitive modulation of pain.[110, 111] However, less research exists to explain the mechanism of other arts-based interventions. Understanding mechanisms of action can lead to the design of more effective interventions.

Research Question 2. What is the evidence on the role of the arts in the prevention of SUD, including OUD?

Research is needed to examine the role of the arts in the prevention of SUD, particularly for young people. Several programs included in the scan draw on positive youth development theory and practice to help participants develop positive life skills and protective factors to prevent SUD, among other negative outcomes. Future research should examine how arts-based prevention programs can impact risk and protective factors related to SUD, including delinquency, psychiatric conditions, violence, and school dropout.[112]

Long-term studies are needed to examine how arts-based prevention programs can impact SUD directly. Several program representatives spoke to the challenges of tracking long-term SUD prevention outcomes, including not having mechanisms to track youth after they complete the program. Young people who complete parole in the juvenile justice system are difficult to track, for example, once their records are erased. Programs should collaborate with researchers well-versed in program evaluation to measure program impacts and to identify strategies for long-term evaluation (e.g., engaging program alumni, linking to juvenile justice and academic data systems to track youth for as long as information is available). Demonstrating program impact through high-quality research could lead to additional or sustained funding.

There is a need for studies that examine the link between the arts and the prevention of SUD within and across developmental periods. More research is needed to understand, for example, which arts-based strategies work for adolescents versus adults. Future studies should explore the impact of arts-based interventions on SUD prevention in a range of developmental stages, such as young children, adolescents, and adults.

Future research should examine the link between the arts and the prevention of SUD by using a population-based approach. A population health approach focuses on the health and overall wellness of broader populations (e.g., communities, neighborhoods, cities, states, nations) rather than providing acute care to individual patients.[113] Some population-based research suggests a positive relationship between self-reported arts engagement and health. For example, a nationwide study in Norway found that participating frequently in music, singing, and theater appears to increase self-reported health for women and reduce mortality for men, regardless of cause.[114] A study in Australia found that those who engaged in the arts for two or more hours per week reported significantly better mental well-being than those with lower levels of engagement.[115] Future research should build on these studies to examine the link between the arts and the prevention of SUD in general populations.

Future research should examine the impact of cultural relevancy and cultural attunement in arts-based prevention programs. The term cultural attunement describes additions to evidence-based therapies that are intended to boost engagement and retention of subcultural group members.[ah] Research has found that participants' feelings about a program's relevance can impact outcomes.[116] Prevention programs not perceived as culturally relevant may have difficulty recruiting and retaining participants. Future research should examine if the cultural attunement or relevance of arts-based programs influences participant engagement, retention, and outcomes. It is important to note that the studies in this review were conducted across a wide variety of cultures, and results from one culture may not be generalizable to another.

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ah Such additions might include providing services in clients' native language, utilizing bicultural staff, and incorporating familiar cultural traditions. Attunement involves making changes to increase reach and engagement, but it does not include modifying core treatment components. Other terms, such as "culturally sensitive," "culturally enhanced," "culturally appropriate," "culturally informed," "culturally grounded," "culture specific," and "culturally focused," have been used to describe deliberate efforts to increase the appeal and effectiveness of interventions that are used with subcultural groups. For more information, see Manuel Barrera Jr. et al., "Cultural Adaptations of Behavioral Health Interventions: A Progress Report," *Journal of Consulting and Clinical Psychology* 81, no. 2 (2013): 196.

Research Question 3. What is the evidence on the role of the arts in the treatment of SUD, including OUD?

Future research should assess outcomes related to substance use. Few studies in this review assessed outcomes related to substance use, such as relapse or abstinence, even though such outcomes are critical for treatment success. Future research should examine the relationship between arts-based interventions and substance use or abstinence.

There is a need for studies that assess long-term measures of sustained recovery. Because most studies focused on individuals in inpatient settings, few examined long-term treatment outcomes. Individuals in detoxification settings, for example, typically remain in the unit for three to five days. To better inform effective treatment strategies, research is needed to examine the relationship between arts-based interventions and measures of sustained recovery, such as long-term abstinence. Long-term follow-up studies should also examine dosage effects and the cost-effectiveness of music interventions.

There is a need for research on individuals with OUD. No studies in this review limited their sample to individuals with OUD. While OUD is similar to other SUDs in many respects, it has several unique features, including high relapse rates. Research suggests that the risk for relapse may be higher for OUD than it is for other types of SUD (e.g., one study reported a relapse rate of up to 91 percent for opiate-dependent individuals following detox[117] compared with relapse rates of 40–60 percent for other types of SUD).[118] Individuals with OUD may also have unique sociodemographic factors. Compared with individuals who have alcohol use disorder, individuals who have OUD are more likely to be single, be unemployed, belong to a lower socioeconomic status, or have a criminal record.[119] Future research should examine the role of arts-based interventions in the treatment of OUD.

Future studies should examine the impact of arts-based interventions other than music on SUD. The program scan found that arts-based programs use a variety of art forms to address SUD. Porch Light, for example, uses several art activities—including mural-making—to improve community awareness, reduce social stigma, and promote resilience and recovery (*see Exhibit 19*). However, only a handful of studies included in the literature review examined arts-based interventions other than music, and most of those had small sample sizes and did not test statistical significance. A preliminary study of a six-week theater project to facilitate community engagement and SUD recovery in veterans found that participants (n = 7) who remained active in the intervention reported improvements in social and occupational participation for up to six weeks afterward. Most participants were also abstinent during the intervention.[120] A study of cinema for adults (n = 17) in a long-term residential treatment facility for SUD found that watching movies helped participants talk about their feelings and think about the future in a hopeful and positive way.[121] These results suggest that arts-based interventions may help people recovering from SUDs, but larger efficacy and effectiveness studies are needed to examine whether results can be linked to participation in the intervention.

Arts-based programs need to partner with researchers in the field of SUD. While the program scan highlights personal testimonials from participants of programs that use arts-based interventions other than music to prevent or treat SUD, a gap exists between what is happening in practice and the empirical evidence base. There is a need for a wider array of arts-based prevention programs to collaborate with researchers who have expertise in program evaluation to measure the impact of these programs.

The field of arts in health needs to establish core outcomes and reporting guidelines. This report found great variation in the quality and consistency of reporting. Missing information made it difficult to collect and synthesize study characteristics. Creating a shared set of core outcomes and reporting guidelines for arts-based interventions would improve research strategies, reporting, evidence synthesis, and future collaboration.

Exhibit 19. Porch Light

Philadelphia residents coping with mental health disorders and SUD find a safe haven in the Porch Light program. Run by Mural Arts Philadelphia, Porch Light brings together teams of participants, artists, and behavioral health providers to create murals that reflect issues of importance to the community, including trauma, homelessness, and recovery. Participants gather at year-round workshops, classes, community events, and paint days.

Porch Light operates three community storefronts in Southeast Philadelphia, Northeast Philadelphia, and Kensington. Since 2017, offerings at the Kensington storefront have included mural making as well as Tuesday Tea and Textiles, Journaling for Survivors, Patches and Prayer Flags, and open mic nights. Certified recovery specialists work alongside participants as peer supports and help connect them to services. All staff are trained to administer Narcan on site.

"[We] follow the motto of art as harm reduction," says Porch Light director Nadia Malik. "Our hope is to try to reduce some of the stigma around [OUD]. ... We don't have any judgment for folks."

So far, the Kensington storefront has had more than 5,000 interactions with community members. Many engage with multiple classes and events throughout the week. Seeing individuals return to the program is a sign of success, Malik says—a reflection of community engagement and growing trust.

Conclusion

The available evidence suggests that music interventions may reduce participants' pain, reduce the amount of pain medication they take, improve their SUD treatment readiness and motivation, and reduce craving. Few studies examined art forms other than music, limiting the ability to draw conclusions for those art forms. Because most studies evaluated the impact of music-based interventions on individuals in hospital settings, results are not generalizable to other treatment settings.

Given the critical need to identify effective strategies for managing pain and preventing and treating SUD, future research on arts-based interventions should examine the following:

- Maintenance of pain management and SUD treatment benefits over time
- Outcomes related to SUD prevention
- Outcomes related to arts-based interventions other than music
- Delivery in community settings, such as social service organizations

Implications for the Opioid Crisis

Few of the studies and programs included in this report examined the relationship between the arts and opioid use in the context of pain management or SUD treatment—possibly because of timing. In October 2018, the SUPPORT for Patients and Communities Act became law. Among its many goals, the legislation aims to promote research to address the opioid crisis, particularly studies of alternative treatments for pain.[122] This research will likely not be available for review for several years. Nonetheless, several implications for the present-day opioid crisis were identified.

The literature review found that music-based interventions may reduce postoperative pain and reduce the consumption of pain medication. This finding is particularly important because individuals often receive opioid therapy to treat an acute problem, such as a surgery or injury, and then transition to chronic use.[123] Music-based interventions may also reduce chronic pain, which is important given the prevalence of chronic pain in the United States. Together, these findings suggest that music has a role within integrated and comprehensive approaches to pain management. However, additional research is needed to establish clinical guidance and indications for use.[124]

The literature review also found that music-based interventions can increase treatment motivation and readiness to change for participants at inpatient SUD treatment centers. These findings suggest music's potential as a complementary part of a comprehensive treatment solution. Offered in combination with evidence-based clinical components, such as behavioral therapies, medications, and recovery support services,[125] music may improve treatment outcomes for individuals with OUD.

These findings are promising because music is enjoyable for most individuals and music-based pain management strategies are easy to learn and inexpensive to implement at home. But additional research is needed to examine the specific impact of music interventions on OUD. Future research should also examine the cost-effectiveness of music interventions for SUD.

Arts-based programs included in the program scan have not measured outcomes related to OUD; still, program representatives believe their efforts can help to achieve the following:

- **Prevent or reduce the need for prescribed opioids.** For example, Art Rx emphasizes partnerships with healthcare practitioners who manage opioid regimes for individuals with chronic pain, with the aim that the program can supplement tapering efforts.
- **Build protective factors to prevent opioid use.** Programs such as Moving in the Spirit, M3, and Prodigy Cultural Arts Program engage young people in the arts to help them develop positive life skills to prevent recreational opioid use.
- **Address stigma and promote recovery.** The Porch Light program's Kensington storefront explicitly engages individuals with and/or in recovery from OUD to address the stigma of use within the community and to promote recovery.

Overall, these findings suggest that music interventions are a promising strategy to enhance pain management and SUD prevention and treatment efforts by optimizing physical, psychological, and social well-being.

Glossary

Acute pain: Pain that typically lasts less than three months and usually has a clear connection to a physically identifiable pain-generating pathology or tissue damage. Expected to resolve as the tissue damage heals.[126]

Analgesic: A drug acting to relieve pain.

Arts: Various branches of creative activity, such as music, painting, literature, and dance. Can include informal activities (e.g., listening to music), formal activities (e.g., music class), and creative arts therapies (e.g., a structured therapeutic program using music led by a certified music therapist).

Chronic pain: Pain that is present for longer than three months and may or may not have a clear and current connection to an identifiable tissue-based cause, structural injury, or defect.[127]

Creative arts therapies: Therapies that intentionally apply the arts to ameliorate disability and illness and to improve health and wellness.[128] As a part of their training, most arts therapists complete professional practice requirements and obtain certification. The National Coalition of Creative Arts Therapies Associations includes the following:

- Art therapy
- Dance/movement therapy
- Drama therapy
- Music therapy
- Poetry therapy
- Psychodrama

Mixed Methods Appraisal Tool (MMAT): A tool used to appraise and describe studies included in systematic mixed studies reviews. The MMAT includes five individual checklists, one each for qualitative studies, quantitative randomized control trials, quantitative nonrandomized studies, quantitative descriptive studies, and mixed methods studies.[129]

Mixed methods study: Research study that combines qualitative and quantitative methods. Common research designs include convergent design, sequential explanatory design, and sequential exploratory design.[130]

Nonpharmacological treatments: Interventions that do not involve medications, including exercise, mind-body practices, psychological therapies, multidisciplinary rehabilitation, mindfulness practices, manual therapies, physical modalities, and acupuncture.[131]

Opioid: Natural or synthetic chemicals that interact with opioid receptors on nerve cells in the body and brain and reduce the intensity of pain signals and feelings of pain. This class of drugs includes the illegal drug heroin; synthetic opioids, such as fentanyl; and pain medications available legally by prescription, such as oxycodone, hydrocodone, codeine, morphine, and many others.[132]

Opioid use disorder: A problematic pattern of opioid use leading to clinically significant impairment or distress, as manifested by at least two of 11 designated criteria (e.g., taking more opioids than intended, craving opioids, experiencing withdrawal symptoms when opioids are not taken) within a 12-month period.[133]

Protective factors: Characteristics associated with a lower likelihood of negative outcomes or that reduce a risk factor's impact.[134]

Qualitative study: Research study that seeks to explore and understand the meaning individuals or groups ascribe to a social or human problem. Common qualitative research approaches include ethnography, phenomenology, narrative research, grounded theory, case study, and qualitative description.[135]

Quantitative descriptive study: Research study used to monitor a population, planning, and generating hypotheses and that is generally concerned with the existing distribution of variables without much regard to causal relationships. Common research designs include incidence or prevalence study with comparison group, survey, case series, and case report.[136]

Quantitative non-randomized study: Research study that estimates the effectiveness of an intervention or studying other exposures that do not use randomization to allocate units to comparison groups. Common research designs include non-randomized controlled trials, cohort study, case-control study, and cross-sectional analytic study.[137]

Randomized controlled clinical trial (RCT): A clinical study in which individual participants are allocated to intervention or control groups by randomization (intervention assigned by researchers).[138]

Risk factors: Characteristics at the biological, psychological, family, community, or cultural level that precede and are associated with a higher likelihood of negative outcomes.[139]

Substance use disorder (SUD):[ai] A disorder that occurs when the recurrent use of alcohol and/or drugs causes clinically and functionally significant impairment, such as health problems, disability, and failure to meet major responsibilities at work, school, or home.[140] *The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5) classifies substance use disorder as mild, moderate, or severe, depending on how many diagnostic criteria (e.g., hazardous use, withdrawal, tolerance) are met within a 12-month period.[141]

ai The term "SUD" is used throughout this report in accordance with the DSM-5 definition published in 2013. When describing specific studies, many of which were published before 2013, the author's original language is used. In 2015, the International Society of Addiction Journal Editors recommended against using stigmatizing terminology, most notably "abuse" and "abuser," in published addiction science. For more information, see The International Society of Addiction Journal Editors, Statements and Guidelines, **http://www.isaje.net/addiction-terminology.html**.

Appendix A. List of Studies Included in the Literature Review

Exhibits A1-A3 list the articles included in the literature review.

Exhibit A1. Pain Management Studies

Ajorpaz, Neda Mirbagher, Abouzar Mohammadi, Hamed Najaran, and Shala Khazaei. "Effect of Music on Postoperative Pain in Patients under Open Heart Surgery." *Nursing and Midwifery Studies* 3, no. 3 (2014). https://doi.org/10.17795/nmsjournal20213.

Allred, Kelly D., Jacqueline F. Byers, and Mary Lou Sole. "The Effect of Music on Postoperative Pain and Anxiety." *Pain Management Nursing: Official Journal of the American Society of Pain Management Nurses* 11, no. 1 (2010): 15–25. https://doi.org/10.1016/j.pmn.2008.12.002.

Alparslan, Güler Balcı, Burcu Babadağ, Ayşe Özkaraman, Pınar Yıldız, Ahmet Musmul, and Cengiz Korkmaz. "Effects of Music on Pain in Patients with Fibromyalgia." *Clinical Rheumatology* 35, no. 5 (2016): 1317–21.

Ames, Nancy, Rebecca Shuford, Li Yang, Brad Moriyama, Meredith Frey, Florencia Wilson, Thiruppavai Sundaramurthi. "Music Listening among Postoperative Patients in the Intensive Care Unit: A Randomized Controlled Trial with Mixed-Methods Analysis." *Integrative Medicine Insights* 12 (2017):1-13. https://doi.org/10.1177/1178633717716455.

Arruda, Maurilene Andrade Lima Bacelar, Marília Arrais Garcia, and João Batista Santos Garcia. "Evaluation of the Effects of Music and Poetry in Oncologic Pain Relief: A Randomized Clinical Trial." *Journal of Palliative Medicine* 19, no. 9 (2016): 943–48.

Billington, Josie, Anne Louise Humphreys, Andrew Jones, and Kate McDonnell. "A Literature-Based Intervention for People with Chronic Pain." *Arts & Health* 8, no. 1 (2016): 13–31.

Bradt, Joke, Noah Potvin, Amy Kesslick, Minjung Shim, Donna Radl, Emily Schriver, Edward J. Gracely, and Lydia T. Komarnicky-Kocher. "The Impact of Music Therapy versus Music Medicine on Psychological Outcomes and Pain in Cancer Patients: A Mixed Methods Study." *Supportive Care in Cancer* 23, no. 5 (2015): 1261–71.

Burrai, Francesco, Valentina Micheluzzi, and Valentina Bugan. "Effects of Live Sax Music on Various Physiological Parameters, Pain Level, and Mood Level in Cancer Patients: A Randomized Controlled Trial." *Holistic Nursing Practice* 28, no. 5 (2014): 301–11.

Castrillon, Tabitha, William J. Hanney, Carey E. Rothschild, Morey J. Kolber, Xinliang Liu, and Michael Masaracchio. "The Effects of a Standardized Belly Dance Program on Perceived Pain, Disability, and Function in Women with Chronic Low Back Pain." *Journal of Back and Musculoskeletal Rehabilitation* 30, no. 3 (2017): 477–96.

Clements-Cortés, Amy. "Artful Wellness: Attending Chamber Music Concert Reduces Pain and Increases Mood and Energy for Older Adults." *The Arts in Psychotherapy* 52 (2017): 41–49. https://doi.org/10.1016/j.aip.2016.10.001.

Comeaux, Tressa, and Susan Steele-Moses. "The Effect of Complementary Music Therapy on the Patient's Postoperative State Anxiety, Pain Control, and Environmental Noise Satisfaction." *Pain Control* 22, no. 5 (2013): 7.

Costa, Fiona, Adam Ockelford, and David J. Hargreaves. "The Effect of Regular Listening to Preferred Music on Pain, Depression and Anxiety in Older Care Home Residents." *Psychology of Music* 46, no. 2 (2018): 174–91. **https://doi.org/10.1177/0305735617703811**.

Czamanski-Cohen, Johanna, O. Sarid, E. Huss, A. Ifergane, L. Niego, and J. Cwikel. "CB-ART—The Use of a Hybrid Cognitive Behavioral and Art Based Protocol for Treating Pain and Symptoms Accompanying Coping with Chronic Illness." *The Arts in Psychotherapy* 41, no. 4 (2014): 320–28.

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Exhibit A2. Substance Use Disorder Prevention Study

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Exhibit A3. Substance Use Disorder Treatment Studies

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Appendix B. Literature Review Methodology

Search Strategy

The search for relevant literature was completed in four steps:

1. Researchers searched publication databases using a combination of search terms (see next section for search terms):
    - MEDLINE
    - PsycARTICLES
    - Psychology and Behavioral Sciences Collection
    - PsycINFO
    - SocINDEX
    - Sociology Source Ultimate
    - CINAHL
    - Arts and Humanities Citation Index
2. Researchers performed backward and forward reference searches, or identified and retrieved additional sources, including gray and white literature, by following chains of citations and sources identified as a result of the initial search. For example, the reference sections of all publications retrieved were examined to identify potentially relevant articles and reports. In addition, "forward snowballing" was performed to see if included articles were cited by relevant published articles.
3. Researchers identified and retrieved additional sources from the program scan, such as published or unpublished findings from a featured program.
4. Researchers obtained sources and materials suggested by the TWG members and the National Endowment for the Arts. For instance, table of contents searches of select journals were conducted.

Search Terms

Search terms were developed using the PICO (population, intervention, comparison, outcome) framework.[aj] Researchers worked with the National Endowment for the Arts and the TWG to populate additional search terms (within the columns in *Exhibits B1–B3*) to capture use of different terminology (e.g., pain reduction versus pain management) and variations in the specific outcomes measured under the broad outcome domains of prevention and treatment. A combination of Medical Subject Headings (MeSH) searching, keyword searching, and text word searching was used. Searches were refined by limiting text word searching to titles.

Exhibits B1–B3 present search terms for each research question. Relevant citations yielded through the search were managed using Zotero reference management software to prevent duplicate citations and allow easy access and management of citations and abstracts.

aj For more information, see Karen Sue Davies, "Formulating the Evidence Based Practice Question: A Review of the Frameworks," *Evidence Based Library and Information Practice* 6, no. 2 (2011): 75–80.

Publication database searches were limited to peer-reviewed sources. White or gray literature, including unpublished dissertations or theses, was not systematically searched for. However, white and gray literature that was identified through backward and forward reference searches (i.e., following chains of citations and sources identified as a result of the initial search) was reviewed.

Eligibility Criteria

Abstracts from studies identified using the above search methods and terms were screened with the following inclusion criteria:

1. The intervention or program emphasized use of the arts to manage pain or to prevent or treat SUD;
2. The intervention or program had a goal of managing pain or preventing or treating SUD;
3. The article discussed outcomes specific to managing pain or preventing or treating SUD;
4. The article was published in English; and
5. The article was published between January 1999 and July 2019.

Abstracts were also screened for the following exclusion criterion: study sample did not represent the target population (i.e., individuals at risk for OUD or other SUD). For example, studies of palliative care patients and young children, including studies of infants with neonatal abstinence syndrome, were excluded. In addition, pain management studies were excluded if the sample was not a clinical population (e.g., experimentally induced pain). SUD literature was excluded if the target was tobacco cessation.

Exhibit B1. Search Terms for Arts-Based Programs and Pain Management

Population	Intervention	Outcome
Chronic pain OR Acute pain OR Clinical pain Or Procedural pain OR Phantom pain OR Neuropathic pain	art OR arts OR artist OR artists OR artistic OR artistry OR artistries OR quilt OR quilting OR quilts OR quilted OR chalk OR "TV" OR stamp OR stamping OR stamps OR origami OR needlework OR stitchery OR woodwork OR woodworking OR woodturning OR "basket making" OR "basket weaving" OR batik OR batiks OR calligraphy OR calligraphic OR carve OR carves OR carved OR carving OR sketch OR sketches OR sketching OR illustration* OR enamel OR enamels OR enameling OR engrave OR engraves OR engraved OR engraving OR gardening OR landscape OR landscapes OR landscaping OR landscaped OR ikebana OR bonsai OR "floral arrangement" OR "floral arrangements" OR "floral arranging" OR "flower arrangement" OR "flower arrangements" OR "flower arranging" OR lithograph* OR printmak* OR "print making" OR "print maker" OR "print makers" OR "silk screen" OR "silk screens" OR "silk screened" OR "silk screening" OR "jewelry making" OR weaving OR woven OR metalwork* OR "metal work" OR "metal working" OR "tin smithing" OR "silver smithing" OR blacksmithing OR acting OR playwriting OR "writing plays" OR "play writer" OR "play write" OR "play writing" OR jazz OR "art based" OR "arts based" OR "creative effort" OR "creative efforts" OR "creative engagement" OR "creative expression" OR "creative expressions" OR "creative medicine" OR "creative practice" OR "creative therapy" OR "creative therapies" OR "creative writing" OR "diary writing" OR diaries OR "emotional writing" OR "group writing" OR "entertainment education" OR "expressive activity" OR "expressive activities" OR "expressive writing" OR "graphic novel" OR "graphic novels" OR "graphic representation" OR "graphic representations" OR "health humanities" OR "journal writing" OR "medical humanities" OR "movement expression" OR "movement expressions" OR "movement therapy" OR "movement therapies" OR "narrative medicine" OR "passive listening" OR "play space" OR "play spaces" OR "role play" OR "role playing" OR "role plays" OR acrylics OR animation* OR artwork* OR ballet OR caricature OR caricatures OR cartoon* OR chants OR chanting OR choir OR choreography OR choreographing OR choreographe* OR clay OR collag* OR comic OR comics OR comicbook* OR danc* OR drama* OR drawing* OR edutainment OR etching* OR film OR films OR filming OR filmed OR fotonovela* OR photonovella* OR handicraft* OR crafts OR crafting OR imaginative OR improvisation* OR journaling OR mandala* OR mural* OR museum* OR music* OR novela* OR novella* OR opera* OR paint* OR photograph* OR photovoice OR "photo voice" OR pictorial OR plays OR poet* OR poem* OR portrait* OR pottery OR puppet* OR radio OR rap OR raps OR rapping OR sandplay* OR sculpt* OR sing OR singing OR skit OR skits OR song* OR story OR stories OR storyline* OR storytell* OR essay OR essays OR television OR textiles OR theatr* OR theater* OR transmedia OR vlog* OR watercolor* OR "water color" OR "water colors" OR "water colour" OR "water colours" OR watercolour* OR youtube OR "you tube" OR movie* OR cinema OR ceramics OR imagery OR mosaic* OR lyrics OR graffiti OR "hip hop" OR aesthetic* OR esthetic* OR "glass blowing" OR "glass fusing" OR knitting OR "rug hooking" OR crochet* NOT (antiretroviral OR "anti retroviral" OR "HAART" OR "assisted reproductive therap*" OR "state of the art")	Pain OR Pain management OR Pain perception OR Pain measurement OR Health promotion OR Well-being OR Quality of life

Exhibit B2. Search Terms for Arts-Based Programs and Substance Use Disorder Prevention

Population	Intervention	Outcome
Adolescents OR Youth OR Adults	art OR arts OR artist OR artists OR artistic OR artistry OR artistries OR quilt OR quilting OR quilts OR quilted OR chalk OR "TV" OR stamp OR stamping OR stamps OR origami OR needlework OR stitchery OR woodwork OR woodworking OR woodturning OR "basket making" OR "basket weaving" OR batik OR batiks OR calligraphy OR calligraphic OR carve OR carves OR carved OR carving OR sketch OR sketches OR sketching OR illustration* OR enamel OR enamels OR enameling OR engrave OR engraves OR engraved OR engraving OR gardening OR landscape OR landscapes OR landscaping OR landscaped OR ikebana OR bonsai OR "floral arrangement" OR "floral arrangements" OR "floral arranging" OR "flower arrangement" OR "flower arrangements" OR "flower arranging" OR lithograph* OR printmak* OR "print making" OR "print maker" OR "print makers" OR "silk screen" OR "silk screens" OR "silk screened" OR "silk screening" OR "jewelry making" OR weaving OR woven OR metalwork* OR "metal work" OR "metal working" OR "tin smithing" OR "silver smithing" OR blacksmithing OR acting OR playwriting OR "writing plays" OR "play writer" OR "play write" OR "play writing" OR jazz OR "art based" OR "arts based" OR "creative effort" OR "creative efforts" OR "creative engagement" OR "creative expression" OR "creative expressions" OR "creative medicine" OR "creative practice" OR "creative therapy" OR "creative therapies" OR "creative writing" OR "diary writing" OR diaries OR "emotional writing" OR "group writing" OR "entertainment education" OR "expressive activity" OR "expressive activities" OR "expressive writing" OR "graphic novel" OR "graphic novels" OR "graphic representation" OR "graphic representations" OR "health humanities" OR "journal writing" OR "medical humanities" OR "movement expression" OR "movement expressions" OR "movement therapy" OR "movement therapies" OR "narrative medicine" OR "passive listening" OR "play space" OR "play spaces" OR "role play" OR "role playing" OR "role plays" OR acrylics OR animation* OR artwork* OR ballet OR caricature OR caricatures OR cartoon* OR chants OR chanting OR choir OR choreography OR choreographing OR choreographe* OR clay OR collag* OR comic OR comics OR comicbook* OR danc* OR drama* OR drawing* OR edutainment OR etching* OR film OR films OR filming OR filmed OR fotonovela* OR photonovella* OR handicraft* OR crafts OR crafting OR imaginative OR improvisation* OR journaling OR mandala* OR mural* OR museum* OR music* OR novela* OR novella* OR opera* OR paint* OR photograph* OR photovoice OR "photo voice" OR pictorial OR plays OR poet* OR poem* OR portrait* OR pottery OR puppet* OR radio OR rap OR raps OR rapping OR sandplay* OR sculpt* OR sing OR singing OR skit OR skits OR song* OR story OR stories OR storyline* OR storytell* OR essay OR essays OR television OR textiles OR theatr* OR theater* OR transmedia OR vlog* OR watercolor* OR "water color" OR "water colors" OR "water colour" OR "water colours" OR watercolour* OR youtube OR "you tube" OR movie* OR cinema OR ceramics OR imagery OR mosaic* OR lyrics OR graffiti OR "hip hop" OR aesthetic* OR esthetic* OR "glass blowing" OR "glass fusing" OR knitting OR "rug hooking" OR crochet* NOT (antiretroviral OR "anti retroviral" OR "HAART" OR "assisted reproductive therap*" OR "state of the art")	Opioid use OR Substance use OR Substance abuse OR Addiction OR Alcoholism OR Amphetamine use OR Cocaine use OR Cannabis use OR Hallucinogens use OR Phencyclidine use OR Inhalants use OR Sedatives use OR Hypnotics use OR Anxiolytics use OR Abstinence OR Depression OR Depressive symptoms OR Anxiety OR Juvenile delinquency OR Delinquent behavior OR Educational attainment OR Academic performance OR Positive youth development OR Social support OR Prosocial peers OR Prosocial activities

Exhibit B3. Search Terms for Arts-Based Programs and Substance Use Disorder Treatment

Population	Intervention	Outcome
Opioid use disorder OR Opioid dependency OR Opioid-related disorders OR Opiates OR Opiate substitution treatment OR Heroin dependency OR Heroin addiction OR Drug abuse OR Drug dependency OR Substance use disorder OR Substance use treatment OR Substance abuse OR Addiction OR Chemical dependency	art OR arts OR artist OR artists OR artistic OR artistry OR artistries OR quilt OR quilting OR quilts OR quilted OR chalk OR "TV" OR stamp OR stamping OR stamps OR origami OR needlework OR stitchery OR woodwork OR woodworking OR woodturning OR "basket making" OR "basket weaving" OR batik OR batiks OR calligraphy OR calligraphic OR carve OR carves OR carved OR carving OR sketch OR sketches OR sketching OR illustration* OR enamel OR enamels OR enameling OR engrave OR engraves OR engraved OR engraving OR gardening OR landscape OR landscapes OR landscaping OR landscaped OR ikebana OR bonsai OR "floral arrangement" OR "floral arrangements" OR "floral arranging" OR "flower arrangement" OR "flower arrangements" OR "flower arranging" OR lithograph* OR printmak* OR "print making" OR "print maker" OR "print makers" OR "silk screen" OR "silk screens" OR "silk screened" OR "silk screening" OR "jewelry making" OR weaving OR woven OR metalwork* OR "metal work" OR "metal working" OR "tin smithing" OR "silver smithing" OR blacksmithing OR acting OR playwriting OR "writing plays" OR "play writer" OR "play write" OR "play writing" OR jazz OR "art based" OR "arts based" OR "creative effort" OR "creative efforts" OR "creative engagement" OR "creative expression" OR "creative expressions" OR "creative medicine" OR "creative practice" OR "creative therapy" OR "creative therapies" OR "creative writing" OR "diary writing" OR diaries OR "emotional writing" OR "group writing" OR "entertainment education" OR "expressive activity" OR "expressive activities" OR "expressive writing" OR "graphic novel" OR "graphic novels" OR "graphic representation" OR "graphic representations" OR "health humanities" OR "journal writing" OR "medical humanities" OR "movement expression" OR "movement expressions" OR "movement therapy" OR "movement therapies" OR "narrative medicine" OR "passive listening" OR "play space" OR "play spaces" OR "role play" OR "role playing" OR "role plays" OR acrylics OR animation* OR artwork* OR ballet OR caricature OR caricatures OR cartoon* OR chants OR chanting OR choir OR choreography OR choreographing OR choreographe* OR clay OR collag* OR comic OR comics OR comicbook* OR danc* OR drama* OR drawing* OR edutainment OR etching* OR film OR films OR filming OR filmed OR fotonovela* OR photonovella* OR handicraft* OR crafts OR crafting OR imaginative OR improvisation* OR journaling OR mandala* OR mural* OR museum* OR music* OR novela* OR novella* OR opera* OR paint* OR photograph* OR photovoice OR "photo voice" OR pictorial OR plays OR poet* OR poem* OR portrait* OR pottery OR puppet* OR radio OR rap OR raps OR rapping OR sandplay* OR sculpt* OR sing OR singing OR skit OR skits OR song* OR story OR stories OR storyline* OR storytell* OR essay OR essays OR television OR textiles OR theatr* OR theater* OR transmedia OR vlog* OR watercolor* OR "water color" OR "water colors" OR "water colour" OR "water colours" OR watercolour* OR youtube OR "you tube" OR movie* OR cinema OR ceramics OR imagery OR mosaic* OR lyrics OR graffiti OR "hip hop" OR aesthetic* OR esthetic* OR "glass blowing" OR "glass fusing" OR knitting OR "rug hooking" OR crochet* **NOT** (antiretroviral OR "anti retroviral" OR "HAART" OR "assisted reproductive therap*" OR "state of the art")	Substance use OR Substance abuse OR Drug abuse OR Opioid use OR Amphetamine OR Cocaine OR Cannabis OR Hallucinogens OR Phencyclidine OR Inhalants OR Sedatives OR Hypnotics OR Anxiolytics OR Abstinence OR Drug avoidance OR Withdrawal OR Craving OR Depression OR Depressive symptoms OR Anxiety OR Motivation OR Participation OR Coping skills OR Healing OR Recovery

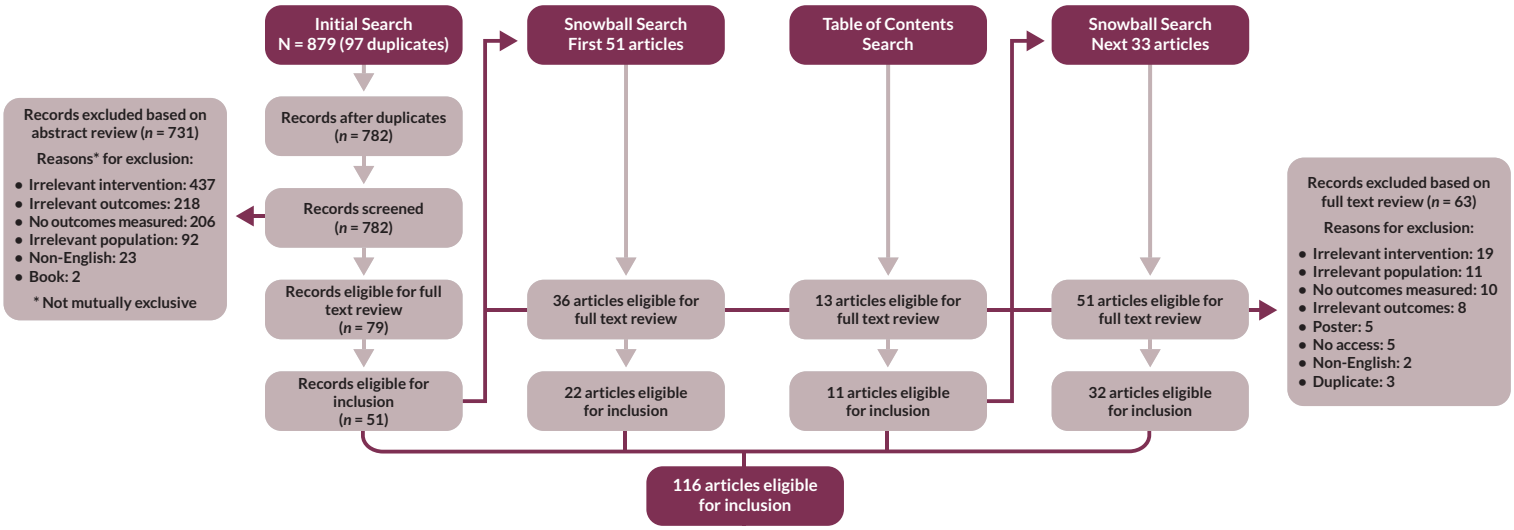
Abstract Review

A team of four researchers was trained on the inclusion/exclusion criteria. Then, using Covidence (an online abstract screening software), two researchers independently reviewed each abstract identified through the search process and coded it for inclusion or exclusion based on the eligibility criteria. In cases of disagreement, researchers met to reach a consensus.

The search and review process ended in a total of 116 articles eligible for inclusion in the final report (for a full list of included articles, see appendix A).

The initial search yielded 879 abstracts, of which 79 were eligible for full text review and 51 were eligible for inclusion in the final report (*see Exhibit B4*).

Exhibit B4. Search Process



The reference sections of the first 51 articles were then reviewed to identify additional potentially relevant articles and reports.

Researchers also performed a table of contents search for four journals that are not indexed by publication databases but that were believed to have relevant literature and encompass a wide range of art forms:

1. *The Arts in Psychotherapy*
2. *Art Therapy: Journal of the American Art Therapy Association*
3. *Arts & Health*
4. *Voices: The Art and Science of Psychotherapy*

The first snowball search and table of contents search resulted in 22 and 11 articles, respectively. A second snowball search was then performed on these 33 articles.

Data Abstraction

A team of four researchers was trained on the data abstraction process. Full text articles selected for inclusion were independently reviewed and coded to abstract necessary data (*see Exhibit B5*). If the study did not include all the information listed, the information was listed as unavailable and reported as a missing element.

Exhibit B5. Data Abstraction Categories

Intervention characteristics	• Name of program, curriculum, or intervention • Funding source • Location • Theoretical model/framework • Targeted outcome areas/goals • Intended content and activities • Format (e.g., music, arts) • Program format (group versus individual) • Medium-specific characteristics (e.g., for music: music characteristics; participant selected versus researcher selected) • Intended frequency and length of services • Staffing/intervener characteristics
Study methodology	• Study design • Internal validity • Sample size • Data collection methods • Primary and secondary outcomes, where relevant
Participant characteristics	• Age • Gender • Race/ethnicity
Outcomes	• Results related to pain or substance use disorders • Results from subgroup analyses • Effect sizes, if reported
Future directions	• Study limitations • Implications

Mixed Methods Appraisal Tool

The Mixed Methods Appraisal Tool (MMAT) was used to appraise and describe the empirical studies included in the literature review. The MMAT includes five individual checklists, one each for qualitative studies, quantitative randomized control trials, quantitative nonrandomized studies, quantitative descriptive studies, and mixed methods studies. Each checklist includes five design-specific quality criteria and guidance for appraising the presence or absence of each item.

The MMAT was reviewed by the National Collaborating Centre for Methods and Tools (NCCMT) as well-suited to public health contexts, particularly for questions related to complex interventions that are context dependent and process oriented.[ak] MMAT instructions for summarizing results align with the increasing shift in the research community to move away from scoring individual studies or using composite scores to appraise evidence.[al] The tool has been validated in several studies testing its interrater reliability, usability, and content validity and was most recently updated in 2018.[am]

Researchers were trained on the MMAT user guide and met routinely to discuss any disagreements in appraisals. Detailed MMAT results for each research question are reported in appendix C.

Validity Checks

Researchers were trained to independently and reliably abstract data using a standardized form and process and to apply the MMAT. To ensure continued accuracy, a second reviewer reviewed, abstracted, and applied the MMAT to 10 percent of studies.

ak For more information, see NCCMT Registry at **http://www.nccmt.ca/resources/search/232**.

al For more information, see Mary Dixon-Woods et al., "Appraising Qualitative Research for Inclusion in Systematic Reviews: A Quantitative and Qualitative Comparison of Three Methods," *Journal of Health Services & Research Policy* 12 (2007): 42–47.

am For more information, see Quan Nha Hong et al., Mixed Methods Appraisal Tool (MMAT), version 2018. Registration of Copyright (#1148552), Canadian Intellectual Property Office, Industry Canada.

Appendix C. Mixed Methods Appraisal Tool Results

The MMAT includes five individual checklists, one each for qualitative studies, quantitative randomized control trials, quantitative nonrandomized studies, quantitative descriptive studies, and mixed methods studies. Each checklist includes five design-specific quality criteria and guidance for appraising the presence or absence of each item. Exhibits C1 and C2 present aggregate checklist items for all pain management and all SUD treatment studies, respectively. Results from the single SUD prevention study are not included because this information could not be reported in aggregate.

Exhibit C1. Mixed Methods Appraisal Tool Checklist Overview for Pain Management Studies

	% Yes	% No	% Can't tell
Qualitative (*n*=1)			
Is the qualitative approach appropriate to answer the research question?	100		
Are the qualitative data collection methods adequate to address the research question?	100		
Are the findings adequately derived from the data?	100		
Is the interpretation of results sufficiently substantiated by data?	100		
Is there coherence between qualitative data sources, collection, analysis and interpretation?	100		
Quantitative randomized controlled trials (n=54)			
Is randomization appropriately performed?	74	7	19
Are the groups comparable at baseline?	83	4	13
Are there complete outcome data?	87	7	6
Are outcome assessors blinded to the intervention provided?	0	100	0
Did the participants adhere to the assigned intervention?	94	4	2
Quantitative non-randomized (n=15)			
Are the participants representative of the target population?	100	0	0
Are measurements appropriate regarding both the outcome and intervention (or exposure)?	100	0	0
Are there complete outcome data?	87	13	0
Are the confounders accounted for in the design and analysis?	40	20	40
During the study period, is the intervention administered (or exposure occurred) as intended?	87	13	0

	% Yes	% No	% Can't tell
Quantitative Descriptive (n=2)			
Is the sampling strategy relevant to address the research question?	50	0	50
Is the sample representative of the target population?	50	50	0
Are the measurements appropriate?	100	0	0
Is the risk of nonresponse bias low?	50	50	0
Is the statistical analysis appropriate to answer the research question?	100	0	0
Mixed Methods (n=7)			
Is there an adequate rationale for using a mixed methods design to address the research question?	100	0	0
Are the different components of the study effectively integrated to answer the research question?	100	0	0
Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	100	0	0
Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	86	0	14
Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	86	14	0

Exhibit C2. Mixed Methods Appraisal Tool Checklist Overview for Substance Use Disorder Treatment Studies

	% Yes	% No	% Can't tell
Qualitative (n=2)			
Is the qualitative approach appropriate to answer the research question?	100	0	0
Are the qualitative data collection methods adequate to address the research question?	100	0	0
Are the findings adequately derived from the data?	100	0	0
Is the interpretation of results sufficiently substantiated by data?	50	0	50
Is there coherence between qualitative data sources, collection, analysis, and interpretation?	50	0	50
Quantitative randomized controlled trials (n=18)			
Is randomization appropriately performed?	89	0	11
Are the groups comparable at baseline?	83	11	6
Are there complete outcome data?	89	11	0
Are outcome assessors blinded to the intervention provided?	0	100	0
Did the participants adhere to the assigned intervention?	100	0	0

	% Yes	% No	% Can't tell
Quantitative non-randomized (n=9)			
Are the participants representative of the target population?	100	0	0
Are measurements appropriate regarding both the outcome and intervention (or exposure)?	78	11	11
Are there complete outcome data?	78	11	11
Are the confounders accounted for in the design and analysis?	56	44	0
During the study period, is the intervention administered (or exposure occurred) as intended?	100	0	0
Quantitative Descriptive (n=2)			
Is the sampling strategy relevant to address the research question?	50	0	50
Is the sample representative of the target population?	100	0	0
Are the measurements appropriate?	100	0	0
Is the risk of nonresponse bias low?	100	0	0
Is the statistical analysis appropriate to answer the research question?	100	0	0
Mixed Methods (n=5)			
Is there an adequate rationale for using a mixed methods design to address the research question?	100	0	0
Are the different components of the study effectively integrated to answer the research question?	100	0	0
Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	100	0	0
Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	100	0	0
Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	80	0	20

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Appendix D. Program Scan Methodology

Search Strategy

An initial list of candidate programs was generated through a search of electronic resources (i.e., federal agency websites, publication databases, and website search engines) using search terms based on those used in the literature search (e.g., "art therapy," "art education," "pain management," "SUD," "OUD"). The federal agency websites and search engines used are listed in Exhibit D1. Search terms are listed in Exhibits D2–D5. Additional programs were also added on the recommendation of the National Endowment for the Arts and the TWG.

Exhibit D1. Federal Agency Websites and Search Engines

Agency name
Substance Abuse and Mental Health Services Administration (i.e., Substance Abuse Treatment Facility Locator)
National Institute on Drug Abuse
Office of Disease Prevention and Health Promotion
Office of Juvenile Justice and Delinquency Prevention—Model Programs Guide; literature review on Arts-Based Programs for Youth
U.S. Department of Health and Human Services
National Institute of Justice—Program and Practice ratings (drugs and crime)
Youth.gov—Program Directory
National Organization for Arts and Health
University of Florida Health Shands/Arts in Medicine

Exhibit D2. Search Terms for Arts Programs and Pain

Population	Intervention	Outcome
Chronic pain OR Acute pain OR Clinical pain Or Procedural pain OR Veterans	Arts programming OR Community arts OR Music OR Dance OR Theater OR Theatre OR Drama OR Poetry OR Expressing writing OR Journaling OR Storytelling OR Visual art	Pain

Exhibit D3. Search Terms for Creative Arts Therapies and Pain

Population	Intervention	Outcome
Chronic pain OR Acute pain OR Clinical pain Or Procedural pain OR Veterans	Art therapy OR Music therapy OR Dance therapy OR Dance/Movement therapy OR Theater therapy OR Theatre therapy OR Drama therapy OR Drama psychotherapy OR Creative arts therapies	Pain

Exhibit D4. Search Terms for Arts Programs and Substance Use Disorder

Population	Intervention	Outcome
Opioid OR Opioids OR Substance use disorder OR Addiction OR Alcohol use disorder OR Alcoholism OR Veterans OR Rural communities OR Incarceration OR Juvenile justice system	Arts education OR Arts programming OR Community arts OR Music OR Dance OR Theater OR Theatre OR Drama OR Poetry OR Expressing writing OR Journaling OR Storytelling OR Visual art	Opioid use OR Drug avoidance OR Withdrawal OR Craving OR Motivation OR Participation OR Helpfulness OR Coping skills OR Depression OR Anxiety

Exhibit D5. Search Terms for Creative Arts Therapies and Substance Use Disorder

Population	Intervention	Outcome
Opioid		Opioid use
OR	Art therapy	OR
Opioids	OR	Drug avoidance
OR	Music therapy	OR
Substance use disorder	OR	Withdrawal
OR	Dance therapy	OR
Addiction	OR	Craving
OR	Dance/Movement therapy	OR
Alcohol use disorder	OR	Motivation
OR	Theater therapy	OR
Alcoholism	OR	Participation
OR	Theatre therapy	OR
Veterans	OR	Helpfulness
OR	Drama therapy	OR
Rural communities	OR	Coping skills
OR	Drama psychotherapy	OR
Incarceration	OR	Depression
OR	Creative arts therapies	OR
Juvenile justice system		Anxiety

Eligibility Criteria

Fifty programs identified using the above search methods were screened for inclusion using the criteria outlined in Exhibit D6.

Exhibit D6. Criteria for Initial Inclusion

Criteria areas	Criteria indicators
Arts focus	• Based on the arts or has prominent components that include the arts as reflected by explicit use of keywords in title/name or published program description
Pain management or SUD prevention of treatment focus	• Centers on pain management or SUD prevention or treatment as reflected by explicit use of keywords in title/name or published program description
Recent or active implementation	• Active or recently implemented (i.e., within the past five years)
Publicly available information	• Information needed to review eligibility criteria is publicly available.
Outcomes supported by some evidence	• Evidence related to program outcomes is available.

Of the 50 programs, eight were eligible for inclusion. Programs included in the scan are listed in the program scan chapter. Programs that were not eligible for inclusion are listed in appendix E.

Data Abstraction

Researchers populated templates summarizing key information (e.g., lead agency or implementer, funding agency or mechanism, target areas, evaluation findings) for each program using a two-step process. First, publicly available information was reviewed and abstracted. Next, program representatives were contacted by a researcher to supplement information populated in the first step.

Appendix E. List of Additional Programs for Consideration

Several interesting and innovative arts-based programs were identified during the initial search for program scan candidates and suggested by TWG members. Exhibit E1 presents those programs that did not meet the criteria for inclusion in this report.

Exhibit E1. Programs for Consideration

Program name
A Place Called Home—Creative Arts and Expression Program
Addiction Performance Project
Adriana Marchione—therapist, teacher, artist, trainer
Anchor Hospital Campus of Southern Crescent Behavioral Health System
Art and Addiction: Putting a Human Face on Addiction and Recovery
Art of Hope
Art of Rancho at Rancho Los Amigos
Art Therapy at Mariners Inn
Art Therapy at St. John Ascension Brighton Recovery Center
Arts for Incarcerated Youth Network
Arts for Life
Boys and Girls Club of the Los Angeles Harbor—Arts Academy
C.A.R.E. (Continuous Ambient Relaxation Environment)
Creative Forces: National Endowment for the Arts Military Healing Arts Network
Culture of Recovery
Dancing with Pain
English Mountain Recovery Program
Face the Music Foundation
Harford County Office of Drug Control Policy
Music Therapy Program at Creative Arts Therapies of the Palm Beaches
Music Therapy Program at Tallahassee Memorial HealthCare
New Hampshire Theatre Project Elephant in the Room Series
New York Writers Coalition
Northbound Treatment Center
NQP Playbook™: Opioid Stewardship
Opioid Safe-Prescribing Training Immersion Program

Program name
Pablove Shutterbugs
PAIN Exhibit Inc.
Partnership for a Drug-Free New Jersey—Heroin and Opioid Art Exhibition
Project Venture
R Creative Collective
Reading for Life
Rock to Recovery
Skyland Trail
Snow City Arts
Somos La Arte
Split This Rock
St. Joseph's Health—Alternatives to Opiates Program
The Bluffs Rehab—Ohio Heroin and Opioid Addiction Treatment Program
Therapeutic Music Program at Vista Del Mar
UCLA Music Partnership Program
YWCA Pasadena/Foothill Valley—Express Yourself!

Endnotes

[1] U.S. Department of Health and Human Services, "HHS Acting Secretary Declares Public Health Emergency to Address National Opioid Crisis," HHS.gov, October 26, 2017, **https://www.hhs.gov/about/news/2017/10/26/hhs-acting-secretary-declares-public-health-emergency-address-national-opioid-crisis.html**.

[2] Heather L. Stuckey and Jeremy Nobel, "The Connection between Art, Healing, and Public Health: A Review of Current Literature," *American Journal of Public Health* 100, no. 2 (2010): 254–63.

[3] Anita Jense and Lars Ole Bonde, "The Use of Arts Interventions for Mental Health and Wellbeing in Health Settings," *Perspectives in Public Health* 138, no. 4 (2018): 209–14.

[4] Stuckey and Nobel, "Connection."

[5] Jense and Ole Bonde, "Use of Arts Interventions."

[6] Bern Heath, Pam Wise Romero, and Kathy Reynolds, *A Review and Proposed Standard Framework for Levels of Integrated Healthcare* (Washington, DC: SAMHSA-HRSA Center for Integrated Health Solutions, March 2013).

[7] U.S. Department of Health and Human Services, "Facing Addiction in America: The Surgeon General's Spotlight on Opioids," Office of the Surgeon General, Washington, DC, 2018.

[8] National Academies of Sciences, Engineering, and Medicine, "Pain Management and the Opioid Epidemic: Balancing Societal and Individual Benefits and Risks of Prescription Opioid Use," National Academies Press, Washington D.C., 2017.

[9] Teresa A. Rummans, M. Caroline Burton, and Nancy L. Dawson, "How Good Intentions Contributed to Bad Outcomes: The Opioid Crisis," *Mayo Clinic Proceedings* 93, no. 3 (2018): 344–50.

[10] Andrew Kolodny et al., "The Prescription Opioid and Heroin Crisis: A Public Health Approach to an Epidemic of Addiction," *Annual Review of Public Health* 36 (2015): 559–74.

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