

StRUM

Stress Reduction Using Music

A Music Therapy in Cardiac Rehabilitation Program

04.03.2021

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IHED 621

Health Communication

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Background

At the start of the 20th century, heart disease was not a common cause of death in the United States (Dalen et al., 2014). In the mid 20th century, deaths due to heart disease peaked and then began to decline (Dalen et al., 2014). Even though heart disease deaths peaked in the 1960s in America and then declined through the early 21st century, it is still the leading cause of death today (Dalen et al., 2014). According to the Centers for Disease Control and Prevention (CDC, 2020), coronary heart disease is killing 655,000 Americans every year. On average, 1 in 4 individuals die of heart disease per year; that's one person every 36 seconds (CDC, 2020). The majority of heart disease deaths occur in White and Black/African American individuals and are more prominent in males than females across all races/ethnic groups (CDC, 2020). In the past decade, despite previous declines, coronary heart disease has resurged in the United States and many other countries (Jones & Greene, 2013). It is being called a public health catastrophe. (Jones & Greene, 2013).

The term heart disease refers to several different heart conditions, the most prominent being coronary heart disease (Centers of Disease Control and Prevention [CDC], 2021). All heart diseases are affected by comorbid medical conditions and lifestyle choices (CDC, 2021). Poor lifestyle choices can lead to an even higher risk of developing a heart condition (CDC, 2021). Some of the lifestyle risk factors include smoking, exercise, sleep, nutrition, and stress. (American Heart Association [AHA], n.d.). Various studies have also shown the impact of mental health on cardiac diseases (CDC, 2021). Some have studies have shown that mental health disorders are related to heart health, including mood disorders, anxiety disorder, post-traumatic stress disorder, and chronic stress (CDC, 2021). Also, coping with these mental health

disorders can lead to adopting other lifestyle factors contributing to poor health and cardiac disease risks (CDC, 2021).

According to the Nation Institute of Mental Health (NIMH, n.d.), stress is defined as "how the brain and body respond to any demand." Everyone experiences stress, and not all stress is negative; however, learning how to cope with stress is vital for long-term health (NIMH, n.d.). In 2019, the average adult reported a stress level of 4.9 on a scale of 1 to 10, with 10 being the highest. In 2020, with the pandemic in full swing, stress levels were reported to have increased from 4.9 to an average of 5.4 (American Psychological Association [APA], 2020). Even though more research is needed to determine the exact effect stress can have on heart health, it is evident that chronic stress can lead to lifestyle behaviors that cause increased heart disease risk (American Heart Association [AHA], 2014). In an attempt to manage stress, one might drink more alcohol, smoke more, or overeat. (AHA, 2014). When experiencing constant stress, the body remains on high alert, increasing breathing, heart rate, blood pressure, and cholesterol levels, which are heart disease predictors (AHA, 2014). Studies using psychological and social therapies show promise in reducing second heart attack risks (AHA, 2014). Research suggests that a person's response to stress, anxiety, and depression are significant contributors that affect the onset of heart disease, interfere with recovery from a cardiac episode, and determine overall prognosis (Parswani et al., 2013).

Participation in a music therapy program and music utilization in everyday life can help reduce stress for those suffering from cardiac diseases (Mandel et al., 2007).

Music therapy utilizes evidence-based music interventions to work toward a goal or objective within a therapeutic relationship with a credentialed music therapist (American Music Therapy Association [AMTA], n.d.). Music has been used for "rational medicine" and spiritual healing ceremonies as early as 6000 B.C. and has been around throughout history (Davis et al., 2008).

During the Renaissance, music was used as preventative medicine and to remedy melancholy, despair, and madness (Davis et al., 2008). Also, during Baroque times, music was used to treat disease (Davis et al., 2008). By the 18th century, scientific medicine became dominant, and music was only prescribed in exceptional cases (Davis et al., 2008). Music in the United States has been used since the 18th century to help with physical and mental conditions, and music therapy as a profession was established in the 20th century (Davis et al., 2008). As holistic approaches in mental health became more popular, volunteers began using music in medical settings in the 1940s (Davis et al., 2008). The National Association for Music Therapy was established in 1950 when music therapists began being compensated for their work (Davis et al., 2008). Today the profession continues to grow and expand in practice and research using evidence-based interventions (Davis et al., 2008).

Generally, music therapists in a medical setting may use music to address goals such as stress reduction, pain management, anxiety reduction, increasing ability to cope, mood modification, procedural support, and end of life support (AMTA, n.d.). Music interventions that aim toward these goals might include live music listening, music-making, music-assisted relaxation and imagery, songwriting, and therapeutic instrument instruction (AMTA, n.d.). Music therapy may be utilized within a hospital cardiac rehab program to help reduce stress and anxiety (Metzger, 2004).

Situational Analysis

Cardiac rehabilitation (cardiac rehab) is defined as "the sum of activities required to favorably influence the underlying cause of the disease, as well as to ensure the patient the best possible physical, mental and social conditions, so that they may, by their efforts, preserve or resume when lost, as normal a place as possible in the life of the community" (Mampuya, 2012). The purpose of cardiac rehab is to prevent a secondary cardiac event relying on early disease

discovery and providing interventions that keep the disease from progressing (Mampuya, 2012). Cardiac rehab programs previously only contained monitoring of the patient (Mampuya, 2012). However, it has evolved, and programs now typically offer medical care, post-operative care, nutrition advice, smoking cessation, identifying risks, stress management, blood pressure control, and diabetes management (Mampuya, 2012). Although cardiac rehab programs are now prevalent in medical systems and are essential to cardiac patients' optimal care, they don't always include the much-needed stress management component (Blumenthal et al., 2016). Stress management and other self-control tools are essential in managing cardiac risk factors (Mampuya, 2012). The INTERHEART study by Yusuf et al. (2004) indicated that stress was the third leading risk for coronary events and accounted for about 30% of all myocardial infarctions. This case-control study took place in over 52 countries and involved over 15,000 cases and just under 15,000 controls (Yusuf et al., 2004). Stress is known to increase risk factors such as blood pressure, cholesterol, blood glucose, and obesity (Mampuya, 2012). Not only does better management of stress reduce risk factors, but it also increases the overall quality of life (Mampuya, 2012).

Within the seven counties in Northeast Ohio (NEO), 7.8% of adults experience coronary heart disease (Healthy Northeast Ohio, 2018). As University Hospitals Cleveland (UH) has medical facilities in each of these counties and only a couple further south in Ohio, we will look at the data from the NEO area as most of the facilities, and most patients are located there (University Hospitals, 2020). In Cleveland alone, 246.3 people die per year per 100,000 in the population, which is in line with the national average (Healthy Northeast Ohio, 2018). As seen in Appendix A, most of those who suffer cardiac deaths in NEO are white or black, non-Hispanic, and male (Healthy Northeast Ohio, 2018). University Hospitals has an average of approximately 600 individuals enrolled in the cardiac rehab program at one time, across the ten medical facilities that offer the program (University Hospitals, 2021). On average, 37% of those enrolled

in the cardiac rehab program are uninsured or self-pay (University Hospitals, 2021). The UH music therapy program is funded through philanthropy with University Hospitals Connor Integrative Health Network and is offered as a free service to patients (University Hospitals, 2020).

When identifying stress management strategies, non-pharmacological therapies are a good option due to few or no side effects and zero problems with abuse or dependence (De Witte et al., 2020). Music therapy is a non-pharmacological modality that research suggests may help reduce stress and provide strategies to manage stress (De Witte et al., 2020). Music in itself has been shown to provide calm and relaxation (De Witte et al., 2020). Music listening reduces stress by decreasing physiological arousal and stimulating the parasympathetic nervous system (De Witte et al., 2020). Music can also reduce negative emotions, increase positive emotions and provide a distraction from everyday stressors (De Witte et al., 2020). Music therapy can increase music's effects through a patient-centered therapeutic relationship (De Witte et al., 2020). Participating in a music therapy group also increases endorphins through bonding and the social process (De Witte et al., 2020). Music therapy is adaptive and uses music aspects to adjust to the patient's needs moment-by-moment (De Witte et al., 2020). For example, through the Iso Principle, music therapists can match the patient's music-making style and regulate physical and emotional systems by changing the tempo and dynamics over time as they follow the musical cues (De Witte et al., 2020). This is an example of music therapy where the patient is actively involved in making music, commonly through improvisation or freestyle playing (De Witte et al., 2020). Passive music therapy is when the patient listens to and verbally processes emotions related to live or prerecorded music provided by the music therapist (De Witte et al., 2020). In a meta-analysis of 47 studies, 76 effect sizes, and 2747 participants on stress reduction outcomes, music therapy showed a medium to strong effect (De Witte et al., 2020).

Blumenthal et al. (2016) demonstrated that a cardiac rehab program that involved stress management and exercise components had better clinical outcomes than one with just an exercise component for those suffering from coronary heart disease. They also stated that stress management added to a cardiac rehab program is more effective than a cardiac rehab program alone, as indicated in Appendix C, Tables 3 and 4 (Blumenthal et al., 2016). Cardiac rehab traditionally takes place in three phases (Mampuya, 2012). The first phase starts in the hospital in the inpatient setting, from stabilization to reintroducing activity for self-care after discharge (Mampuya, 2012). Phase two consists of a three to a six-month outpatient program in which the patient undergoes supervised physical activity and risk reduction education (Mampuya, 2012). Phase three involves a lifetime maintenance program where the patient continues at home what was learned in phase two (Mampuya, 2012). Although there is a difference between music listening via a recording of music and "music therapy," which we defined earlier, both are considered viable for reducing stress (De Witte et al., 2020). The following stress reduction using music for cardiac rehabilitation program will provide the protocol best suited for effective stress management and reduction program utilizing evidence-based music interventions in all three phases.

SWOT Analysis

		Positives	Negatives
I N T E R N A L	Strengths	<ul style="list-style-type: none"> • System-wide healthcare accessibility across NEO • Cardiac Rehab programs already in place across ten hospitals • Music therapy is currently available and funded at ten hospitals across the system • Music therapy currently utilizes stress management techniques in the medical setting • Space already exists for education groups within cardiac rehab facilities or locations • Access to PR/marketing materials for the program 	Weaknesses <ul style="list-style-type: none"> • Music therapists already carry a full-time caseload • Cardiac rehab often too unorganized to collaborate in new programming from a different department • Flawed referral system for music therapy from the cardiopulmonary department within other collaborative existing programs
	E X T E R N A L	Opportunities	<ul style="list-style-type: none"> • The Hospital system provides for communities across NEO • University Hospitals is partners with Case Western Reserve University who is the NEO affiliate for the American Heart Association • The music therapy program is funded via established philanthropy and brings in over 1 million dollars in revenue per year • Music therapy services are free for hospital patients and community members • Music therapy is respected with hospital leadership and well-received in the community • Stress management has increased in need globally due to pandemic

Key Stakeholders and Partners

University Hospitals Cleveland is a national leading healthcare system striving to strengthen healthcare needs in the NEO community (University Hospitals, 2020). The system consists of many community partners, including local organizations, other healthcare systems, research teams, and education systems (University Hospitals, 2020). Case Western Reserve University (CWRU) School of Medicine is University Hospital's affiliate university (University Hospitals, 2020). CWRU is a research member of the Northeast Ohio Affiliate of the American Heart Association (AHA) (University Hospitals, 2020). This chapter of the AHA would be one of the first critical advocates of the StRUM program, along with branches in any of the ten locations where UH has a cardiac rehab facility. Other advocates will include the NEO Department on Aging and the Ohio Cardiovascular Health Collaborative. These collaborators across NEO provide resources and care for those looking for unique opportunities for stress management regarding cardiac health.

Key stakeholders in the program include cardiology specialists and cardiac staff at each medical facility. The StRUM program will require buy-in from cardiology departments across the system to have the opportunity to administer the program to their patients. Another stakeholder would be UH Connor Integrative Health Network (UH CIHN) who employs all of University Hospitals' music therapists. They also provide funding and research opportunities for complementary modalities across the system.

One partner in the StRUM program would be the Music is Elementary music store in Cleveland, Ohio. They offer both traditional and music therapy base instruments. They will provide those instruments for use, along with a discount on new instruments and continued lessons for cardiac rehab participants. This music store, along with NEO Guitar Center locations

and Drum N Strum Music Studios in Ashland, Ohio, will provide access to music stores within 20 miles of each UH cardiac rehab location. Another partner will be the YMCA of Greater Cleveland, Ashland, Elyria, Parma, Geauga, and Ashtabula. They can provide specialists in wellness areas to support music therapy, such as yoga teachers for breathing techniques or exercise instructors for stretching to music.

Primary Audience

The StRUM program's target audience is patients whose physician has referred for the cardiac rehab program at all University Hospitals Cleveland locations. As previously stated, although cardiac rehab programs are now prevalent in medical systems and are essential to optimal care of cardiac patients, they don't always include a stress management component (Blumenthal et al., 2016).

Music therapy has proven to be motivating, engaging, and easily generalized to utilize in everyday living (Davis et al., 2008). As an addition to a cardiac rehabilitation program, music therapy is a viable modality to help psychosocially with negating risks and motivating rehabilitation (Metzger, 2004).

Secondary Audience

The StRUM program's secondary audiences will be the leadership team and cardiopulmonary rehabilitation managers at University Hospitals of Cleveland locations. Although the program is focused on cardiac rehab outpatients, these audiences will be making the decisions regarding the hospital's ability and need to offer the program.

Objectives

1. Increase awareness of the effects of stress on cardiac health by 40% among cardiac rehab participants.
2. To enroll 30% of cardiac rehab patients in the StRUM program.
3. Increase the understanding of music interventions' effects on stress reduction by 20% of StRUM participants during a 12-week cardiac rehabilitation program.
4. Increase the use of music interventions in everyday life learned in the StRUM program by graduates of the cardiac rehab program by 5% one-month post StRUM graduation date.

This program's objectives target cardiac rehab patients, and the importance of understanding the effects stress can have on cardiac health and the prevention of second cardiac events. Once this awareness takes place, it is then essential to enroll these outpatients in the StRUM program. The StRUM program will educate, create experiential music interventions, and provide a generalization of music to use at home. These components will inform participants about how music can help with stress and will allow them to experience those effects. The experiences will help reduce stress in the moment and then provide information on how to continue to use these interventions for stress management beyond the rehab program.

Behavior Change Framework

The StRUM program is based on Ajzen's Theory of Planned Behavior (TPB), an extension of Fishbein's Theory of Reasoned Action (TRA). They both focus on the best predictor of health behavior being one's intention and motivational factors (Montano & Kasprzyk, 2015). As seen in Appendix B, Intention is determined by one's attitude toward and subjective norms about the behavior (Schiavo, 2014). TPB adds that intention is also determined by one's perceived control over performing the behavior (Montano & Kasprzyk, 2015). It is reported in

several studies that changing TPB ideas will lead to behavior change (Montano & Kasprzyk, 2015).

StRUM aims to change attitudes toward the effects of stress on the heart and use music for stress management through the program's education component. Participants of a cardiac rehab program might not understand what stress is, what it feels like, the importance of one's reaction to stress, and how all of this affects the heart. Also, StRUM will educate about music therapy and how music affects the brain, emotions, and how it helps one deals with stress.

StRUM will occur in a group setting, reinforcing, through peer support, the negative aspects of living with stress and the positive aspects of using music to cope with stress. Music is generally a well-accepted form of "therapy," and using music to cope with stress can be shared with loved ones. With the hospital's support of music therapy programming and the lack of side effects to music, many doctors are willing to advocate for music to help with stress. Music is also adaptable to many cultures to make interventions relatable for participants of different backgrounds and acceptable to their support system. The principle modality in music therapy is music, representing a particular culture, including oneself and the society to which the individual belongs (Kim & Whitehead-Pleaux, 2015). Family members are also welcome to attend and participate in all StRUM sessions for enhanced support.

Music therapy is not only motivating but is also aimed at providing successful experiences (Davis et al., 2008). Music Therapy experiences are deliberately designed and supported by the music therapist to promote positive experiences for the patient, leading to positive effects on self-esteem and self-efficacy (Hohmann et al., 2017). Interventions in the StRUM program will be accessible and adaptable to many abilities and needs. Participant's preferred music will be utilized to reinforce the enjoyment of using music to manage stress and

therefore improve adherence to the program. Music therapy is patient-centered, and music is available through many mediums. The music therapist will ensure that each group member identifies a way to access music.

Strategies and Tactics

University Hospitals (UH) cardiac rehab program consists of exercise, education, counseling, cardiovascular risk factor modification services, and patient and family support. Simultaneously, emphasis is placed on exercise, nutrition, stress reduction, smoking cessation, and education on how the heart works (University Hospitals, 2020). The UH cardiac rehabilitation program is accessible in 10 different locations across the system (University Hospitals, 2020). Cardiac rehab takes place in three crucial phases at UH (University Hospitals, 2020). Phase one begins in the hospital during inpatient admission (University Hospitals, 2020). Phase two is a 12-week program in the supervised outpatient setting (University Hospitals, 2020). And phase three is a lifelong commitment to reducing risk and preventing a second cardiac episode (University Hospitals, 2020).

The StRUM program can be introduced during the patient's inpatient admission by the same music therapist leading the program at that location. This introduction will help create rapport, enhancing the therapeutic relationship, and reducing hesitancy and insecurities about participation during phase two. Once the patient is enrolled in the cardiac outpatient phase, the StRUM program will be offered. A patient can also be referred by their doctor, a nurse, other hospital staff, family members, or friends. The music therapists will offer the StRUM sessions after the exercise rehabilitation sessions in the cardiac rehab department's education room. According to a study conducted by Jia et al. (2016), music may be effective in improving parasympathetic reactivation, which results in faster recovery time and a reduced risk of cardiac

stress after exercise. The outpatient will participate in one music therapy session and be provided education on stress management, music therapy, and those effects on cardiac health. The patient will then have the opportunity to continue with music therapy group sessions for a total of 6 sessions during their 12-week program. The patient may also request to participate in individual outpatient sessions with the music therapist, based on the particular music therapists availability.

Each of the StRUM music therapy sessions will consist of an educational component, a music therapy experiential intervention for acute symptoms, and a generalization portion. The patient will receive handouts and ideas to utilize concepts at home. Evidence-based music therapy interventions will include music listening, music-making, music-assisted relaxation and imagery, music instruction, and songwriting. Although each intervention will focus on using music to aid in stress management, music therapy experiences can also produce secondary benefits such as pain reduction, anxiety reduction, increased coping, isolation reduction, self-expression, and brightened mood or reduced depressive feelings (Davis et al., 2008). All of these possible positive outcomes of music therapy can support overall health maintenance, personal well-being and increase quality of life (Davis et al., 2008).

Campaign Channels

Type	Vehicle or Tactic	Audience	Timeline
Interpersonal	-Email with music therapists to explain the campaign and each role	-Music Therapists	-Pre
	-Phone calls from the cardiac rehab team	-CR patients	-Throughout
	-Phone calls from music therapists	-CR patients	-Throughout
	-Referrals from doctors	-CR patients	-Throughout
	-bedside visits from music therapist	-Patients	-Throughout
Groups	-Information presentation taken to the experts	-Cardiologists and staff -UH CIHN	-Pre
Community	-Presentations for community advocate group meetings -Events with community advocate groups	-Advocate organization members -Advocate organization members	-Pre and throughout
Mass Media	-Newspaper -Television news spot -Pamphlets - placed in the hospital and cardiac rehab facilities and doctors offices, surgery waiting rooms, at the AMA, YMCA, and counseling and senior centers	-Patients -Patients -Patients and family -Support group members and advocate associations	-Pre
New Media	-Videoconferencing -Telehealth -UH Facebook page	-Experts -Patients -Patients -Experts -Advocate Associations	-Pre -Pre -Pre and throughout
Digital Media	-UH website	-Patients -Experts -Advocate Associations	-Pre
	-UH broadcast TVs	-Patients -Experts	-Pre

Campaign Timeline

Start Date	Completion Date	Activity	Responsible Parties
May 2021	July 2021	<ul style="list-style-type: none"> -Obtain buy-in from UH Connor Integrative Health -Obtain buy-in from hospital leadership -Obtain buy-in from cardiac specialists and managers across the system -Obtain music therapists buy-in 	-Campaign manager
July 2021	August 2021	<ul style="list-style-type: none"> -Print materials and prepare presentation -Set up meetings with partners -Set up presentations with Advocate groups -Create a survey for CR patient focus group -Focus group with music therapist 	<ul style="list-style-type: none"> -Campaign team -Campaign manager
August 2021	November 2021	<ul style="list-style-type: none"> -Provide feedback from focus group survey -Present to advocate groups in all locations -Present to partners in all locations -Distribute pamphlets -Create and send a press release -Create a page on the UH website -Create posts on the UH Facebook page 	<ul style="list-style-type: none"> -Campaign manager -Campaign team -Advocates -Experts -Campaign team
November 2021	December 2021	<ul style="list-style-type: none"> -Meet with cardiac rehab and music therapy teams to organize the communication for the program launch 	-Campaign team
January 1, 2022	April 1, 2022	<ul style="list-style-type: none"> -PROGRAM LAUNCH: StRUM program offered at all 10 UH cardiac rehab programs 	-Experts
April 2022	May 2022	<ul style="list-style-type: none"> -Post-Campaign evaluation -Meeting with the UH marketing team to continue with created marketing strategies for ongoing involvement in the program -Meeting with UH CIHN to continue relationships with advocates and partners 	-Campaign manager and team
	June 1, 2022	<ul style="list-style-type: none"> -Final Campaign report due 	-Campaign team

Budget Considerations

Expenditures	Costs	Funding
Campaign Personnel (2)	\$75,000	UH CIHN program expense
Campaign Materials	\$10,000	MT marketing expense
Curriculum Materials	\$10,000	MT materials expense
Music Therapist time/expertise	\$31,200	MT salaries

Budget Considerations/Narrative

The StRUM campaign and program will be considered a UH CIHN programming expense covered under yearly operations and marketing of programming. The UH CIHN expressive therapies yearly expenses and music therapist salaries will cover the program materials and expertise. This program is considered a part of regular music therapy programming. It will add to offerings in the hospital provided by the music therapy team.

Evaluation

An essential component of any quality campaign is to evaluate the undergone process to determine the program's plan and launch effectiveness. After the campaign, surveys will be given to all participants involved in the planning, launch, and program. Experts will receive a survey in regards to the process and feedback obtained from their patients. And cardiac rehab patients will be given a survey in regards to program participation and effectiveness. Also, one-month post evaluation, a randomly selected 50% of StRUM participants will be contacted via phone by their music therapists to evaluate generalization and continuation of program knowledge and interventions. This evaluation will help determine strengths, weaknesses, and improvement areas for the campaign and the resulting program.

Research Methods

Objectives	Method
Objective 1: Increase awareness of the effects of stress on cardiac health by 40% among cardiac rehab participants.	Pre surveys for CR participants Post survey for CR participants
Objective 2: Enroll 30% of cardiac rehab patients in the StRUM program.	Retrieval of data from hospital EMT system
Objective 3: Increase the understanding of music interventions' effects on stress reduction by 20% of StRUM participants during a 12-week cardiac rehabilitation program.	Pre surveys for StRUM participants Post surveys for StRUM participants
Objective 4: Increase the use of music interventions in everyday life learned in the StRUM program by graduates of the cardiac rehab program by 5% one-month post StRUM graduation date.	Music therapists will conduct follow-up post-evaluation phone calls.

Conclusion

According to the evidence provided regarding the effects of stress on overall health and especially on those with coronary heart disease, a more robust and applicable stress management education component needs to be implemented within the UH cardiac rehab program. Music is a universally accepted modality for stress relief. Music therapy can educate patients on using it in a therapeutic context—considering the cost, availability, knowledge, and expertise of music therapists across the UH system. It makes economic sense and provides UH patients with accessibility to complementary methods at no cost to them to help enhance their health and experience at UH.

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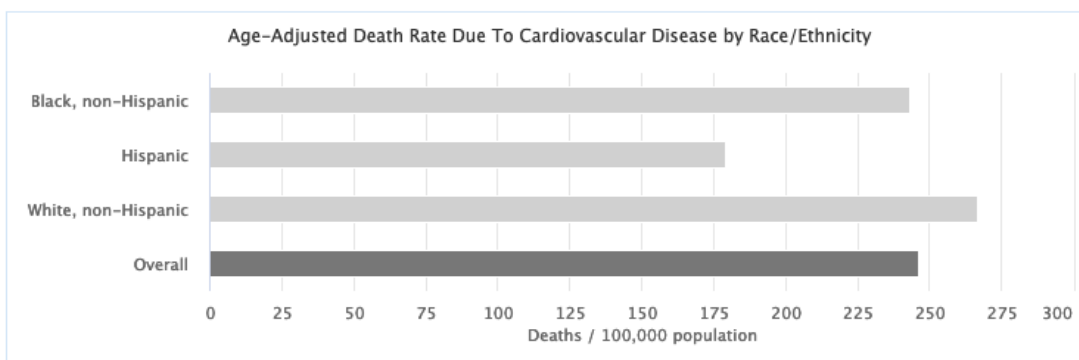
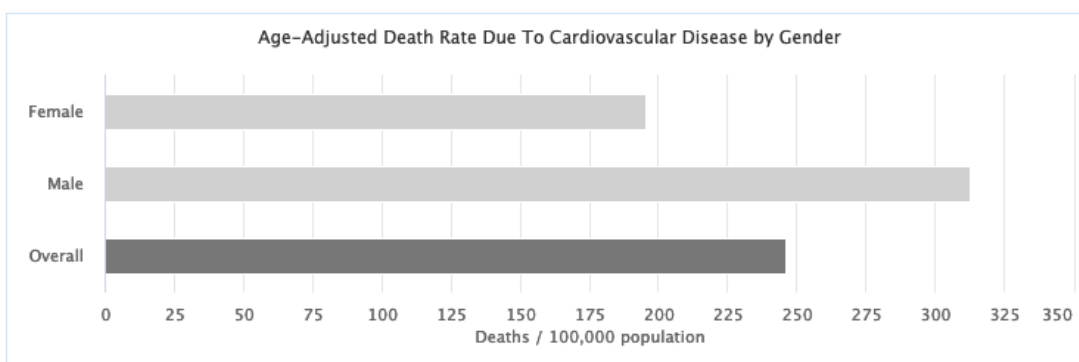
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Appendix A

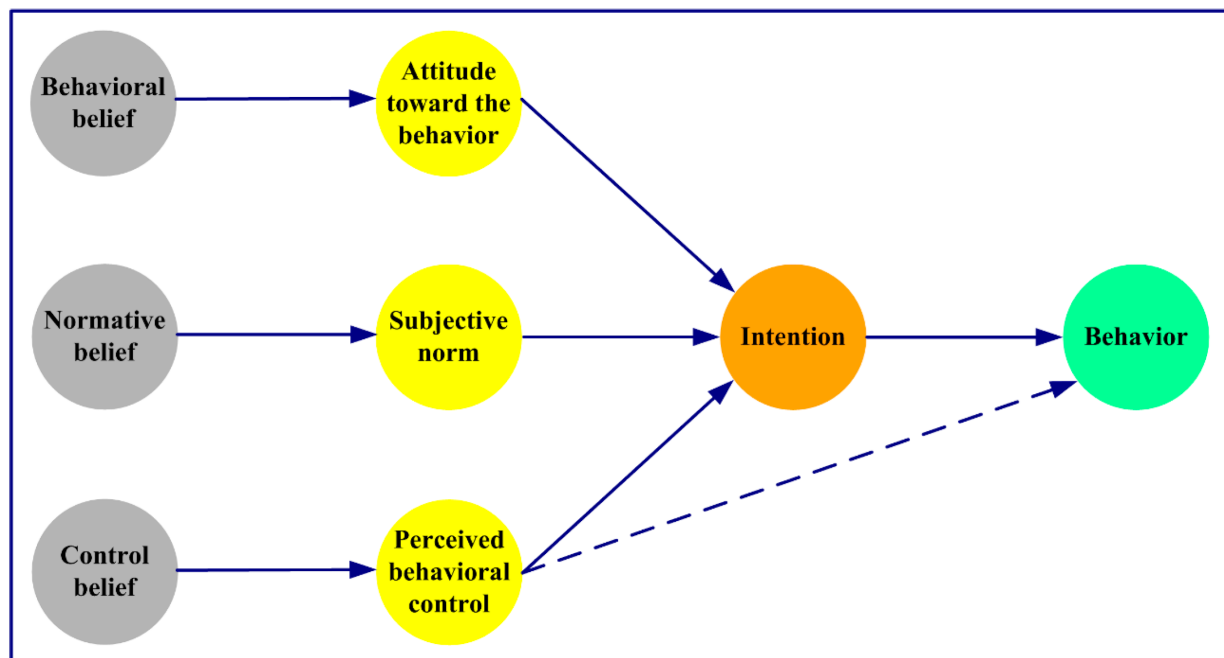
Race of Ethnic Group	% of Deaths	Men, %	Women, %
American Indian or Alaska Native	18.3	19.4	17.0
Asian American or Pacific Islander	21.4	22.9	19.9
Black (Non-Hispanic)	23.5	23.9	23.1
White (Non-Hispanic)	23.7	24.9	22.5
Hispanic	20.3	20.6	19.9
All	23.4	24.4	22.3

From “Community Dashboard,” by Healthy Northeast Ohio, 2018,
 (<http://www.healthyneo.org/indicators/index/view?indicatorId=10833&localeId=139209&localeChartIdxs=1|2|3|4>)



From “Community Dashboard,” by Healthy Northeast Ohio, 2018,
 (<http://www.healthyneo.org/indicators/index/view?indicatorId=10833&localeId=139209&localeChartIdxs=1|2|3|4>)

Appendix B



From “Application of the Theory of Planned Behavior in Environmental Science: a Comprehensive Bibliometric Analysis,” by Hongyun, S., Shi, J., Tang, D., wen, S., Miao, W., & Duan, K., 2019, *International Journal of Environmental Research and Public Health*, 16(15), p. 2 (doi:10.3390/ijerph16152788)

Appendix C

From "Enhancing Cardiac Rehabilitation with Stress Management Training," by Blumenthal, J. A., Sherwood, A., Smith, P. J., Watkins, L., Mabe, S., Kraus, W. E., Ingle, K., Miller,

Table 3. Treatment Effects on CHD Biomarkers, Lipids, and Physical Activity After Adjustment for Pretreatment Level of Each Outcome

Variable	CR+SMT (n=76)	CR (n=75)	Time Effect	P, CR+SMT Versus CR
Lipids, mg/dL				
Total cholesterol	-22.9 (-31.9 to -14.0)	-20.0 (-29.7 to -10.2)	<0.01	0.99
LDL cholesterol	-24.2 (-31.7 to -16.8)	-22.4 (-30.5 to -14.3)	<0.01	0.99
HDL cholesterol	3.0 (1.2 to 4.7)	2.7 (0.7 to 4.6)	<0.01	0.99
Triglycerides	-7.4 (-21.2 to 6.4)	-11.2 (-26.6 to 4.2)	0.22	0.99
CHD biomarkers				
hsCRP, mg/L	-0.9 (-1.4 to -0.5)	-0.4 (-0.9 to 0.0)	<0.01	0.95
HRV-DB, ms	13.1 (-8.0 to 34.3)	26.0 (5.5 to 46.5)	0.055	0.99
Low-frequency HRV, log transformed	0.17 (-0.08 to 0.41)	0.28 (0.04 to 0.51)	0.075	0.99
High-frequency HRV, log transformed	0.08 (-0.11 to 0.27)	0.22 (0.03 to 0.41)	0.17	0.99
Baroreflex sensitivity, ms/mm Hg	0.47 (-0.39 to 1.33)	0.93 (0.09 to 1.77)	0.21	0.99
Aerobic fitness and physical activity				
Leisure-time physical activity, min	20.6 (15.6 to 25.5)	15.9 (10.8 to 21.0)	<0.01	0.67
Exercise treadmill duration, min	1.2 (0.8 to 1.7)	1.5 (1.1 to 1.9)	<0.01	0.99
Exercise treadmill metabolic equivalents	1.5 (1.1 to 1.8)	1.5 (1.2 to 1.9)	<0.01	0.99
Accelerometry total steps, n	1412 (213 to 2610)	687 (-520 to 1893)	0.092	0.99

Values are presented as mean change scores from baseline (95% confidence intervals). *P* values are adjusted for multiplicity within each domain with a Bonferroni correction. CHD indicates coronary heart disease; HDL, high-density lipoprotein; HRV, heart rate variability; HRV-DB, heart rate variability during deep breathing; hsCRP, high-sensitivity C-reactive protein; and LDL, low-density lipoprotein.

P., & Hinderliter, A, 2016, *Circulation*, 133, p. 1346 (DOI: 10.1161/CIRCULATIONAHA.115.018926)

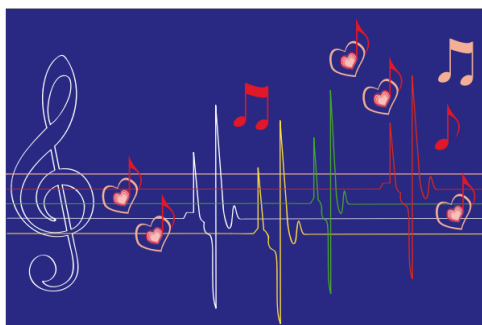
Table 4. Clinical Events for the CR+SMT, CR-Alone, and No-CR Groups

Group	Total Events, n (%)	Death, n	MI, n	Stent/CABG, n	Stroke/TIA, n	Peripheral Revascularization, n	Angina Requiring Hospitalization, n
CR+SMT (n=76)	14 (18)	0	1	9	1	1	2
CR alone (n=75)	25 (33)	2	6	11	1	3	2
No CR (n=75)	35 (47)	4	9	12	3	0	7

CABG indicates coronary artery bypass grafting; CR-alone, cardiac rehabilitation alone; CR+SMT, cardiac rehabilitation enhanced with stress management training; MI, myocardial infarction; No CR, nonrandomized comparison group who did not participate in cardiac rehabilitation; and TIA, transient ischemic attack.

From "Enhancing Cardiac Rehabilitation with Stress Management Training," by Blumenthal, J. A., Sherwood, A., Smith, P. J., Watkins, L., Mabe, S., Kraus, W. E., Ingle, K., Miller, P., & Hinderliter, A, 2016, *Circulation*, 133, p. 1347 (DOI: 10.1161/CIRCULATIONAHA.115.018926)

Appendix D: Creative Brief



StRUM Campaign

Purpose

The StRUM campaign aims to provide an evidence-based stress management program to the University Hospitals Cardiac Rehabilitation program across the healthcare system in Northeast Ohio. Stress management is an integral part of overall health, especially for those with heart disease. Music therapy is proven to provide effective coping strategies in dealing with stress. Music is motivational, dynamic, engaging, and enjoyed by most, making it a perfect addition to enhance the quality and increase outcomes of a complete cardiac rehab program.

Target Audience

Primary Audience: Cardiac rehabilitation patients

Secondary Audience: Hospital leadership, Cardiologists, and Cardiology staff

Communication Objectives

1. Increase awareness of the effects of stress on cardiac health by 40% among cardiac rehab participants.
2. Enroll 30% of cardiac rehab patients in the StRUM program.
3. Increase the understanding of music interventions' effects on stress reduction by 20% of StRUM participants during a 12-week cardiac rehabilitation program.
4. Increase the use of music interventions in everyday life learned in the StRUM program by graduates of the cardiac rehab program by 5% one-month post StRUM graduation date.

Barriers

- Can music be a therapy that can help me with my physical ailment?
- I don't have time to add more to my cardiac rehabilitation time, which already takes up over an hour of my time three times per week.
- I don't have time in my day to practice these coping strategies for stress management.

Benefits

- Music therapy is an evidence-based practice that is motivating, engaging, and easy in which to participate.
- Once patients experience the music interventions and use them in everyday life, they will experience reduced stress and the negative consequences of chronic fight or flight, sympathetic nervous system response.
- Music therapy services at University Hospitals are provided at no cost to the patient.
- Suppose a patient has always wanted to learn to play an instrument. In that case, this may be their opportunity to learn and use the process for stress reduction.

Tone

The tone should be exciting yet calm and non-intimidating. Music is fun and easy and won't take much effort, but it provides many benefits.

Channels

- Emails
- Phone Calls
- Referrals
- Presentations
- Events
- Newspaper
- Television
- Pamphlets
- Videoconferencing
- Facebook
- Website
- Hospital Broadcast TV