

## **Music in Care (MIC) – Development of a Questionnaire to Characterize Nurses’ Attitudes and Feasibility of Implementation on the Use of Music in Patient Care**

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## ABSTRACT

**Significance:** Music has evidence-based applications as an adjunct for a variety of conditions (e.g., reducing pain, anxiety, agitation). This study examines how nurses apply music during patient care.

**Purpose:** To develop Music in Care (MIC), a questionnaire designed to characterize nurses' attitudes and practices of delivering music during patient care, as well as facilitators and barriers toward nurses implementing music into care.

**Method:** A mixed-methods web-based questionnaire with both open- and closed-ended questions was sent via email to nurses working on inpatient units at University of Florida Health Shands Hospital.

**Findings:** 348 nurses responded to the questionnaire. The average age of respondents was 34.1 years old ( $SD=11.0$ ) and the average length of nursing career was 8.6 years ( $SD=9.3$ ). seventy-eight percent of the nurses endorsed music as having significant benefits when implemented and eighty-nine percent of nurses reported having used music in their care. In open-ended questions, nurses identified a lack of equipment as a key barrier to implementing music in care.

**Discussion:** Nurses reported having a positive attitude toward the use of music, strongly endorsing its utility in patient care, and while nurses reported implementing music, a significant proportion of nurses reported barriers to implementation of music in patient care.

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## INTRODUCTION

A growing number of hospitals are integrating Arts in Medicine programs into healthcare (Repar & Patton, 2007; Sonke et al., 2015). Music is a key component of these programs. Burgeoning evidence suggests that patients who receive music therapy or other music interventions during their hospital stay have increased satisfaction with their care (Mandel et al., 2014; Xu et al., 2021). Typically, music therapists and musician volunteers provide music services to patients as part of hospital arts programs (Zhang et al., 2018). In the United States, the Certification Board for Music Therapists (CBMT) has certified over 9,000 music therapists (Certification Board for Music Therapists, 2024). Based on workforce surveys done by the American Music Therapy Association (AMTA), only 14% of these music therapists work in medical settings (Knott et al., 2020). In comparison, there are approximately 35.5 million hospitalizations annually in the United States (Reid & Fang, 2022). Due to the limited number of music therapists working in medical settings and the large number of patient hospitalizations, only a small minority of hospitalized patients can receive music interventions from music therapists. A larger professional workforce being involved in delivering music interventions would ensure many more hospitalized patients experience the benefits of music interventions.

Nursing is the largest health professional workforce in the United States. In 2019, there were approximately 4.95 million registered Nurses (RNs) in the United States (Smiley et al., 2021). Nurses are in a unique position to implement music interventions for patients admitted to hospitals. Compared to other health professions, nurses spend the most time with patients [nurses 33% vs. physicians 15% vs. other critical support staff 20%], in an intensive care unit (Butler et al., 2018). Additionally, a longitudinal study found that nurses spend 37% of their time with patients, when assessed over the course of several years (Westbrook et al., 2011). This allows increased opportunities for nurses to implement music interventions, as they become more familiar with the needs and preferences of their patients, which could in turn allow

them to identify patients who might benefit most from music interventions. Additionally, nurses approach patient care holistically, considering both the physical and emotional health of patients (Thornton, 2019). Multiple studies have shown that music promotes physical and emotional well-being in the inpatient setting (Corey et al., 2019; Lee et al., 2005; Phipps et al., 2010).

Increasing research evidence demonstrates the benefits of music as an effective non-pharmacologic intervention for patients in hospital settings (Evans, 2002; Mandel et al., 2014). Music has been shown to have an influence on patients' physical and psychological health (Boersma et al., 2021; Dale, 2021; Dingle et al., 2021; Sihvonen et al., 2017). Mounting evidence suggest that music modulates stress responses, reduces physiological arousal (e.g., heart rate, blood pressure, muscle tension), enhances positive emotions, and distracts from painful or unpleasant experiences (Chanda & Levitin, 2013; Kemper & Danhauer, 2005; Nilsson, 2008). For example, Nilsson and colleagues (2005) found that music listening significantly decreased cortisol levels in postoperative patients. While the underlying mechanisms by which music influences health-related outcomes are not fully understood (Bowling, 2023; Howlin & Rooney, 2020; Legge, 2015), proposed mechanisms underlying the influence of music on health includes stress reduction, affect regulation, and reward processing (Chanda & Levitin, 2013; Juslin & Västfjäll, 2008; Kemper & Danhauer, 2005; Van Goethem & Sloboda, 2011). Menon and Levitin (2005) used fMRI to investigate whether listening to music modulates brain networks involved in reward and affective processing. The authors showed that listening to music significantly activated neural networks involved with reward processing (i.e., nucleus accumbens and ventral tegmental area) and neural networks involved in modulating emotional responses (e.g., hypothalamus and insula). Together, these findings suggest that music may be a promising adjunct to normal care practices for patients in hospital settings (Evans, 2002).

Music has been implemented in hospital settings both individually and in group formats using both active and passive methods (Hartling et al., 2013; Lin et al., 2011). In active

methods, the patient is involved in the creation of the musical experience (i.e., playing instruments, singing, selecting music), whereas in passive methods, the patient is simply the recipient of the music experience (patient listens and does not provide input) (Lynch et al., 2021). A common individual method for implementing music is 'music listening,' where the patient listens to music that he or she finds to be pleasurable. This intervention can be either active or passive depending on if the patient selects the music. Slow tempo, soothing music is often used, but the specific music used does not make a significant difference in terms of outcomes (Hole et al., 2015). Music implemented in patient groups may involve singing, playing a musical instrument, or listening to music as a group. Music therapy is a specialized practice of music intervention performed by licensed music therapists (Edwards, 2016). It involves the use of music interventions by a credentialed professional to accomplish individualized goals within the context of a therapeutic relationship (American Music Therapy Association, 2024). In contrast, 'music interventions' is a broader term that describes any use of music by healthcare professionals (e.g., nurses) with the intention of improving patient outcomes. For this study, the term 'music intervention' encompasses any use of music by a nurse with the intent of improving patient outcomes.

Despite the positive physical and psychological health benefits that music interventions confer, there is a lack of research on the frequency and type of music interventions that are being carried out by nurses in hospital settings. The current study aims to characterize the current attitudes and practices of nurses on use of music during patient care and explore the feasibility of implementing music into care by identifying facilitators and barriers. We developed the Music in Care (MIC) questionnaire and disseminated it to nurses working in an inpatient hospital setting. Determining whether music is being used or not, how it is being used, and identifying barriers and facilitators to its implementation could highlight an important area for improvement in the healthcare system and elucidate ways to make music more accessible as an adjunct intervention to the standard of care.

## METHOD

### *Study Design*

The current study used a cross-sectional survey design. Survey questions were developed to ensure a valid and logical design, as well as to minimize the influence of systematic bias by using survey development principles discussed in Salant & Dillman's (1994) book.

### *Questionnaire*

We developed a web-based, mixed-methods questionnaire entitled *Music in Care (MIC)* which is available in Appendix A. The questionnaire consisted of 48 questions including 9 demographic questions, 20 questions on nurses' attitudes toward implementation of music into patient care, 13 questions on facilitators and barriers to implementing music into care, and 4 questions on nurses' current implementation methods of music into care. Two open-ended questions invited feedback on significant barriers and facilitators, and overall attitude regarding the use of music in care by nurses. The questionnaire was administered in Qualtrics (Provo, UT).

The questionnaire employed multiple question types including: 5-point Likert scale questions, multiple choice questions, multiple responses using fill in the blank, and open-response questions. The questionnaire took approximately 5-10 minutes for respondents to complete. Demographic and employment data collected included age, years of employment in nursing, gender, race, ethnicity, highest level of education, primary patient population the respondent worked with, and type of unit the respondent worked on (medical-surgical or intensive care unit /intermediate care unit).

### *Sample*

The MIC questionnaire was distributed to licensed registered nurses (RNs) working on inpatient units at the University of Florida (UF) Health Shands Hospital in Gainesville, FL. Participants included RNs alone, as well as RNs with advanced education, such as those with a Master of Science in Nursing (MSN) and/or a Doctor of Nursing Practice (DNP). Licensed Practical Nurses (LPNs) did not participate in the study. The questionnaire invitation was sent via email to approximately 3,500 nurses. A total of 348 nurses partially or fully completed the survey. Respondents were between the ages of 20 years old to 70 years old, and had a minimum of one month to a maximum of 49 years of experience in the nursing profession. Respondents reported working on a wide variety of inpatient units (i.e., general and specialized intensive care units, general and specialized medical-surgical units, intermediate care units).

### *Data collection*

The UF Health Nursing Research Council distributed the MIC questionnaire using their email listserv to nurses who work on inpatient units at the UF Health Shands Hospital. This listserv included both general and specialized medical-surgical and intensive care units. Therefore, nurses with an RN (including those with an additional advanced degree) received an invitation by email to complete the MIC questionnaire on February 20, 2024. After two weeks, invitations to complete the questionnaire were sent once more. Recipients of the email were requested not to complete the questionnaire if they had already completed it when the survey was first distributed. To ensure the survey was not completed twice, the corresponding feature was enabled in Qualtrics, placing a cookie on respondents' browser to prevent them from taking the survey again if the participant used the same electronic device and browser. Honorarium was offered in the form of a \$25 debit card to ten randomly selected participants.

### *Rigor*

There is a lack of research that investigates nurses' use of music in patient care. The current research is the first study to characterize nurses' use of music in patient care. The MIC questionnaire was reviewed by several experts in nursing practice (co-author: LP), qualitative research methods (co-author: J-M S), survey development (co-author: MDM), and integration of arts and medicine (co-author: MRL) throughout its formulation in order to address content validity. In addition, the questionnaire was administered to five bedside nurses who provided feedback on the instrument in order to address face validity. Further, reverse-coded questions were embedded into the questionnaire to identify straight-lining in responses. The questionnaire was refined based on feedback from both experts and bedside nurses.

### *Ethical considerations*

The study was classified as exempt by the UF Institutional Review Board (IRB) due to minimal risk to participants. Therefore, the study was granted expedited IRB ethical approval. All participants consented to participate in the study prior to data collection.

### *Statistical analyses*

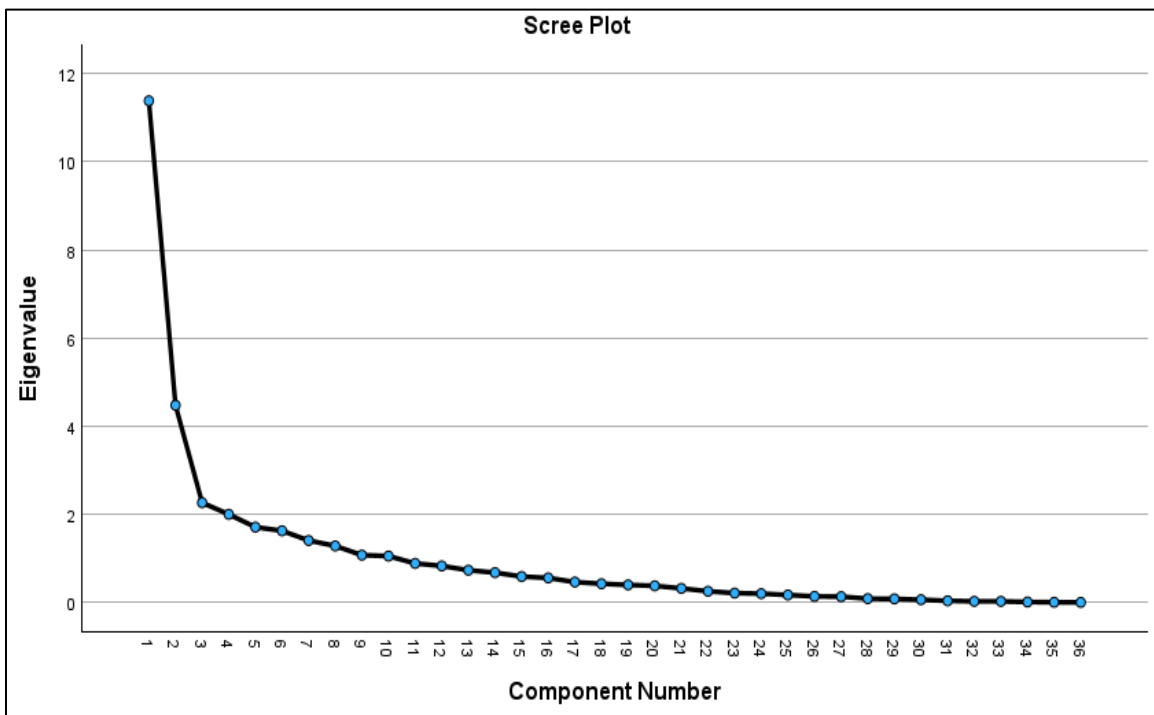
Statistical analyses were conducted using IBM Statistical Package for Social Sciences (SPSS) version 29.0. Exploratory factor analysis was conducted using a principal components factor analysis with varimax rotation in order to reduce the items in the questionnaire based on constructs that are related (Yong & Pearce, 2013). Questions that loaded .40 or higher and were not loading on other factors, were considered part of the factor (Howard, 2016). The criteria were set in order to identify items that were highly correlated with the factor, but not highly correlated with other factors. Descriptive statistics reported as mean and standard deviation or frequency and percentage were used to characterize the demographic and professional

characteristics of the sample. Similarly, descriptive statistics reported as frequency and percentage were used to examine nurses' attitudes, barriers, and facilitators on the implementation of music in patient care.

To interpret qualitative data from the two open-ended questions, word frequency analysis was performed using ATLAS.ti (Berlin, Germany). Insignificant words like conjunctions and prepositions were excluded, as well as some study specific, highly frequent words, including "music", "patient", "patients", "nurse", and "nurses." The 15 most used words for each question are listed in Figure 6 and Figure 7.

## RESULTS

The scree plot indicates that the data most likely have three factors (Figure 1). However, based on theoretical rationale and review of the factor loadings, 4 factors were retained in the study. These factors included nurses' attitudes, facilitators, barriers, and implementation of music during care. Out of the 48 initial survey questions, 36 questions were entered into the exploratory factor analysis. Of these 36 questions, we retained 7 questions for the nurses' attitudes factor, 5 questions for the facilitators factor, 3 questions for the barriers factor, and 3 questions were retained for the implementation factor. See Appendix A for the 18 final questions that were used in the current study analyses.



**Figure 1.** Exploratory factor analysis scree plot. *Note:* Component number refers to factor loadings.

*Demographic and professional characteristics*

The first time the questionnaire was distributed, 219 participants responded. The second time the questionnaire was distributed, an additional 129 participants responded. Thus, a total of 348 participants responded to the MIC questionnaire. Two participants did not consent to participate, 38 participants partially completed questionnaire, and 308 (89.0%) participants completed all closed-ended components of the questionnaire. In the optional, qualitative section of the questionnaire, 220 participants responded to the first open-ended question and 218 responded to the second open-ended question. Patient demographics are presented in Table 1. The majority of respondents were female (90.8%), white (80.4%), and non-Hispanic (90.2%). Most nurses' highest level of educational achievement was at the BSN level, with an average of 8.6 years of nursing experience. Respondents primarily cared for adults (70.0%) in the intensive care unit (ICU)/intermediate care (IMC) units (62.7%).

**Table 1. Demographic and employment Characteristics of the Study Population**

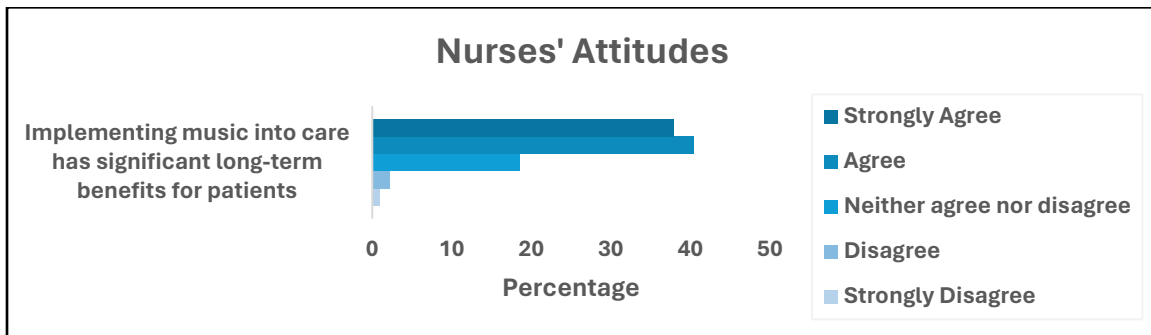
Population Characteristic	M or N (SD or %)
<b>Age (n=327)</b>	34.1 (11.0)
<b>Years employed as a nurse (n=324)</b>	8.6 (9.3)
<b>Gender (n=327)</b>	
Male	30 (9.2%)
Female	297 (90.8%)
<b>Race (n=323)</b>	
Asian	46 (14.1%)
Black/African American	27 (8.3%)
White/Caucasian	262 (80.4%)
Other	7 (2.1%)
<b>Ethnicity (n=327)</b>	
Hispanic	32 (9.8%)
Non-Hispanic	295 (90.2%)
<b>Education (n=327)</b>	
RN	98 (30.0%)
RN/BSN	198 (60.6%)
MSN	26 (8.0%)
DNP	5 (1.5%)
<b>Primary Patient Population (n=327)</b>	
Infants	48 (14.7%)
Children	50 (15.3%)

Adults	229 (70.0%)
<b>Type of unit (n=327)</b>	
ICU/IMC	205 (62.7%)
Non-ICU/Non-IMC	1 22 (37.3%)

Note: ICU = Intensive Care Unit; IMC = Intermediate Care

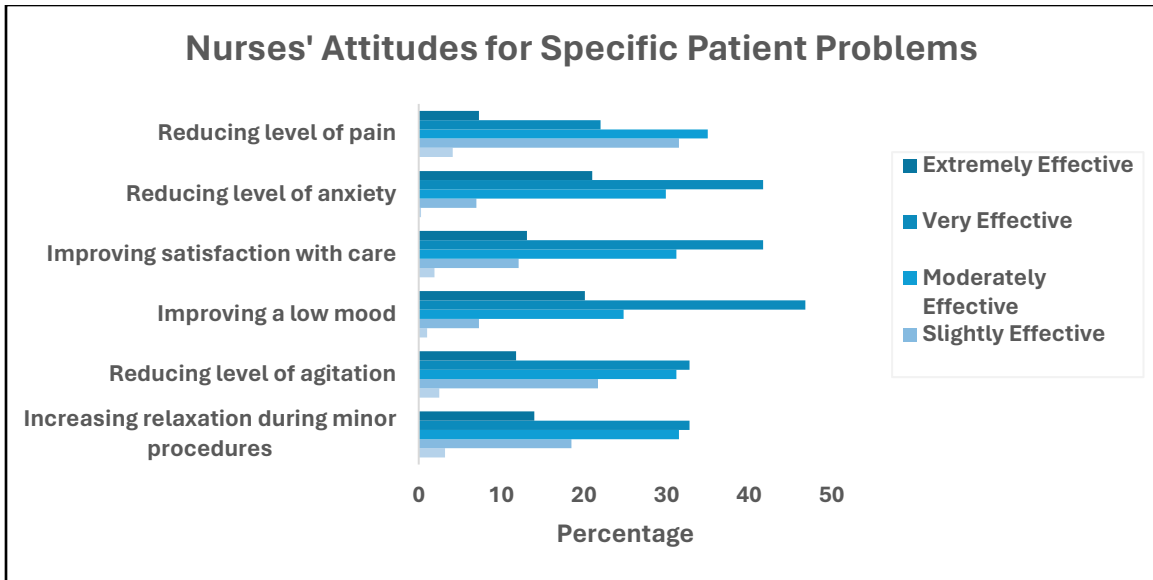
### Attitudes

In Figure 2A, nurses were asked about their attitudes on the implementation of music in care. The majority of nurses (78.0%) either agreed or strongly agreed that music has significant long-term benefits for patients.



**Figure 2A.** (n=319). Nurses' attitude regarding the use of music in patient care.

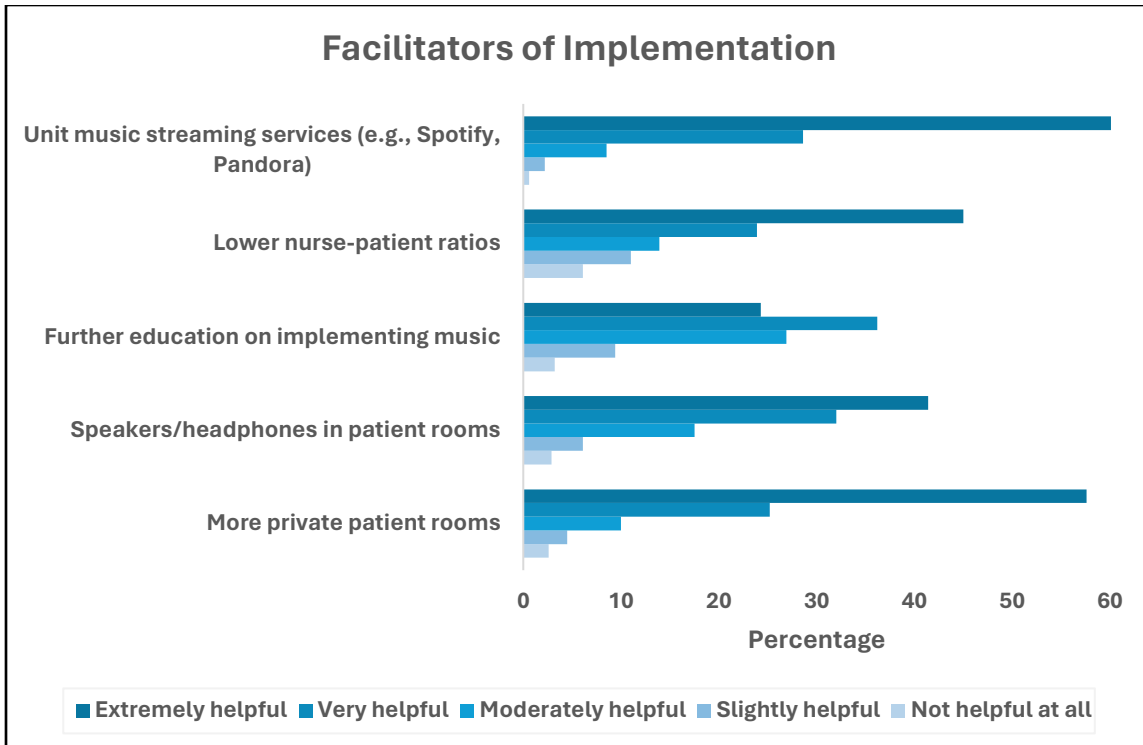
In Figure 2B, nurses were asked to rate how effective they thought music could be for a series of patient problems on the inpatient hospital unit which they primarily work. The majority of nurses described music as being at moderately, very, or extremely effective for reducing pain (64.3%), reducing anxiety (92.6%), improving satisfaction with care (86.0%), improving mood (91.7%), reducing agitation (75.8%), and increasing relaxation during minor medical procedures (78.3%) (e.g. needlestick). Nurses reported that implementing music into care was particularly helpful for reducing anxiety; over half of respondents (62.7%) stated that music was very effective or extremely effective for reducing level of anxiety in patients.



**Figure 2B.** (n=314). Nurses' perceived effectiveness of music on clinically relevant outcomes.

### *Facilitators*

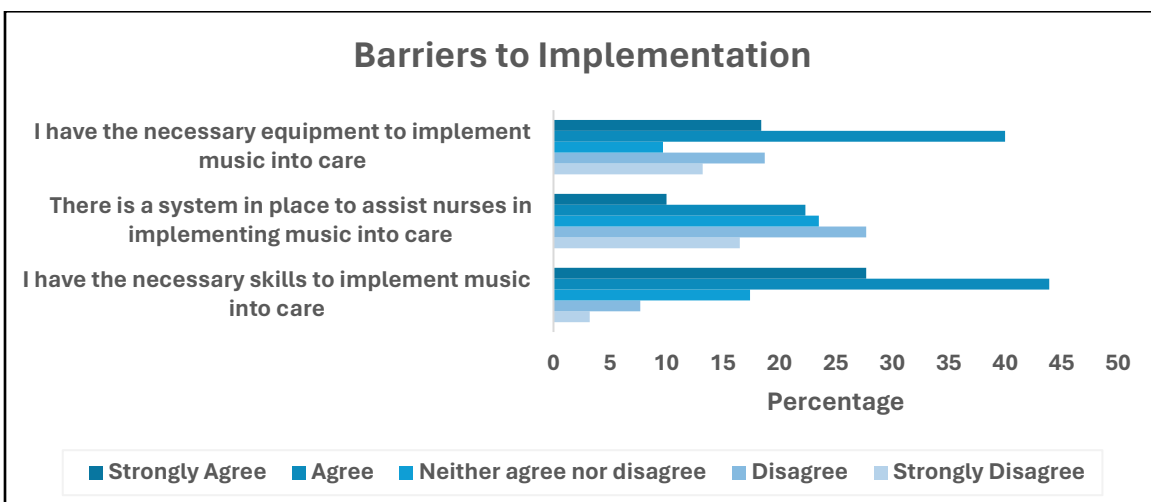
In Figure 3, nurses were asked about factors that would support the use of music in patient care. A total of 68.9% of respondents endorsed that lower nurse-patient ratios would be very helpful or extremely helpful, 60.5% of respondents reported further education on implementation of music into patient care would be very helpful or extremely helpful, and 73.4% of respondents stated that having speakers/headphones in patient rooms would be very helpful or extremely helpful. Nurses reported that unit music streaming services (e.g., Spotify, Pandora) available for nurses to stream music for patients and private patient rooms would be particularly helpful for implementing music into patient care. Specifically, 88.7% of nurses endorsed that having music streaming services on the unit would be very helpful or extremely helpful and 82.8% of nurses reported that having more private rooms would be very helpful or extremely helpful.



**Figure 3.** (n=309). Changes within the hospital setting that would facilitate nurses' use of music in patient care.

### Barriers

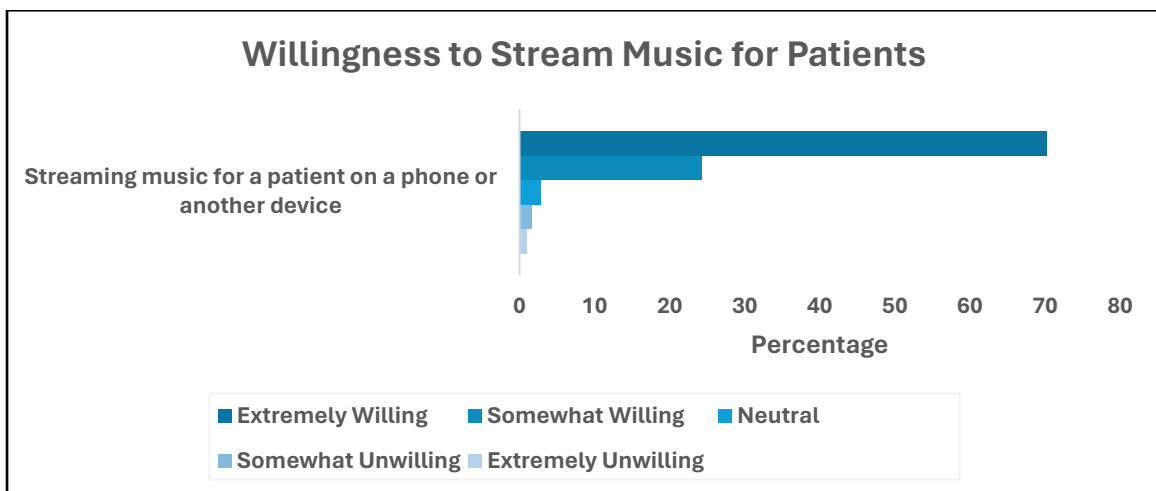
In Figure 4, the majority of nurses reported that they have the necessary skills (71.6%) and equipment (58.4%) to implement music into care. Responses were mixed as to whether a system is in place to assist nurses in implementing music into care, with more nurses disagreeing or strongly disagreeing (44.2%) than agreeing or strongly agreeing (32.3%).



**Figure 4.** (n=310). Barriers that impeded nurses' use of music in patient care.

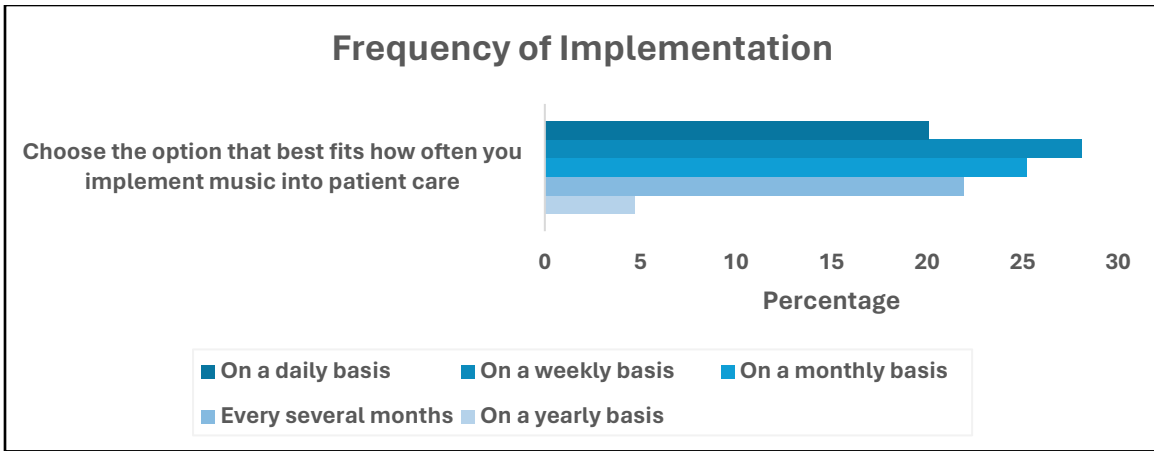
### Implementation

In Figure 5A, nurses rated their willingness to carry out a music intervention from completely unwilling to extremely willing. The overwhelming majority (94.6%) of nurses were very willing or extremely willing to carry out music interventions like streaming music for patients.

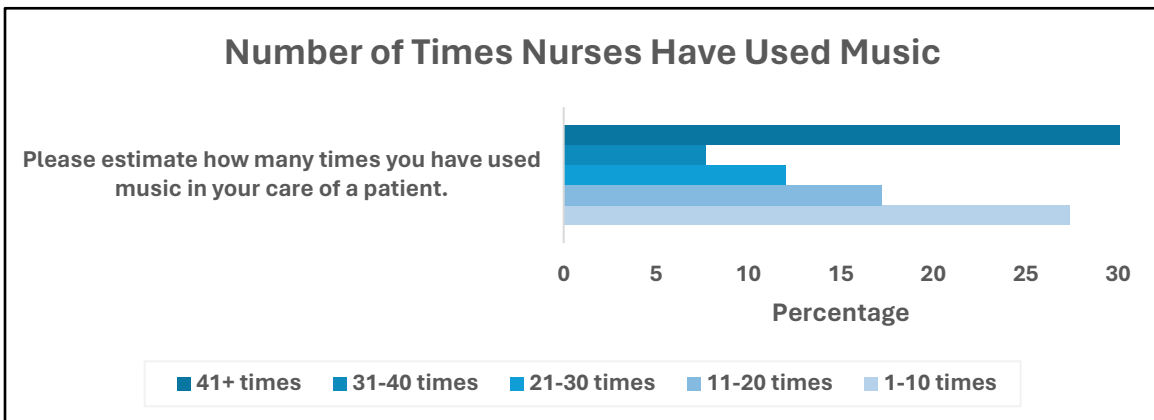


**Figure 5A.** (n=313). Nurses' willingness to carry out music intervention.

Figures 5B and 5C described the frequency with which nurses implemented music into their patient care. It is important to note that only nurses who answered “yes” to a previous question that asked whether they had ever implemented music into care (89.0%, n=274), were presented with these questions. About half (48.1%) of nurses reported implementing music on a weekly basis or more frequently (Figure 5B). While 27.4% of nurses reported using music less than 10 times in their care of patients, 35.8% of nurses reported using music greater than 40 times in the care of their patients (Figure 5C).

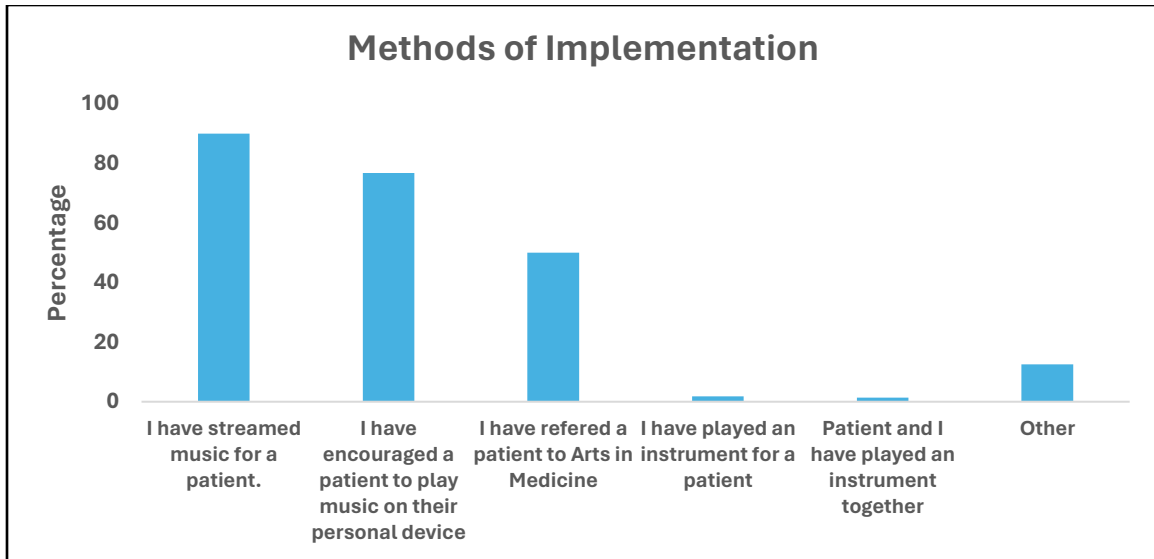


**Figure 5B.** (n=274). Nurses reported how often they typically implement music within their clinical practice.



**Figure 5C.** (n=274). Nurses reported the number of times they had used music

Eighty-nine percent of nurses reported on the methods used to implement music in their care of patients. Figure 5D illustrates the percentages of these nurses that have carried out selected music interventions. The three most frequently used methods of implementation were streaming music for a patient (90.0%), encouraging a patient to play music on the patient's personal device (76.8%), and referring a patient to the hospital's Arts in Medicine program (50.0%).



**Figure 5D.** (n=274). Methods used to implement music in patient care.

### Qualitative Analyses

Figures 6A and 6B lists the most frequently used words in response to the first open-ended question. Responses to this question yielded data about the barriers and facilitators on implementing music into patient care. “Streaming” was the most frequently used word in responses to the question, appearing 53 times. In most units, nurses reported streaming music for patients in three ways, 1) through the computers located in patient rooms, 2) through the television located in patient rooms, and 3) through a personal device. When streaming music through the computers, nurses report privacy concerns, non-therapeutic interruptions (e.g., advertisements, automatic sign-off), and poor audio quality. Comments from four different participants highlighted the themes reported by respondents about the barriers to implementing music into patient care:

First participant stated, *“currently if I want to play music for a patient, I have to login to the computer and leave it up, which is a privacy issue. Because I don’t want to leave my hospital account exposed, there’s no way for me to play music unless it’s on*

their personal device. I would also have to either use my own music accounts or YouTube with ads, which isn't the best option."

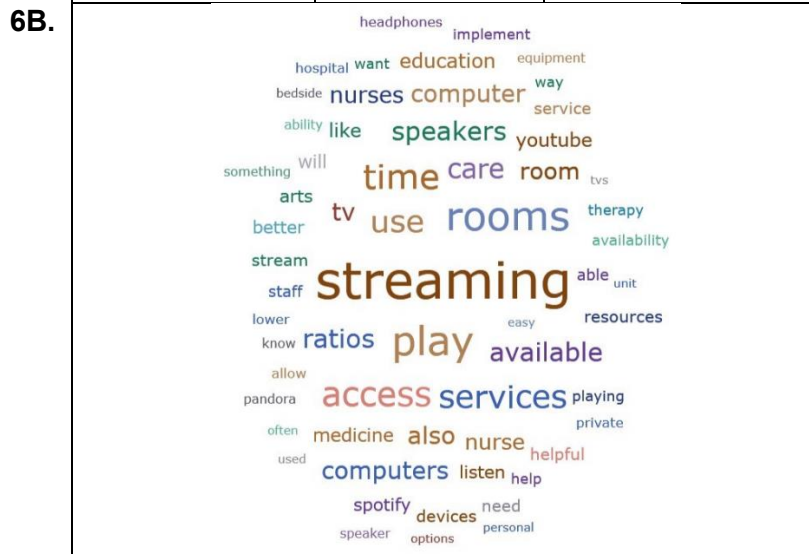
Second participant stated, "better sound system - sometimes it's difficult to hear from the computer's speakers." When using the television to implement music into care, nurses report limited options that do not match the music choice of many patients.

Third participant stated, "need something other than our computers to stream music on. We are constantly logging on and off for safety and we can't stream music that way. Stations on TV are okay, but not always the genre patients want."

Fourth participant reported, "Music options on the TV menu are extremely limited and generic."

**6A.**

"Streaming"	53	"Services"	31	"Speakers"	24
"Play"	40	"Use"	30	"Computer"	22
"Rooms"	40	"Care"	25	"TV"	22
"Time"	34	"Available"	24	"Room"	21
"Access"	33	"Ratios"	24	"YouTube"	16



**Figure 6.** (N=220). Words used in response to the question, "What changes are needed in the hospital that would make it possible for you to implement music into care?" **A.** Frequency of words used, and **B.** Word cloud based on responses. The size of each word is proportional how frequently the word was reported.



## DISCUSSION

An emerging body of evidence demonstrates a positive association between physical and psychological health benefits and the use of music during clinical patient care (Boersma et al., 2021; Dale, 2021; Dingle et al., 2021; Sihvonen et al., 2017). While music interventions have traditionally been delivered by certified music therapists, patients' need for these interventions far exceed the capacity of the music therapist workforce (Croene, 2003). In contrast, nursing is the largest health professional workforce and nurses are well-positioned to implement music into patient care to maximally impact patient outcomes through a holistic approach to healthcare. However, there is a lack of research on the nurses' perspective, current practices of implementation, and the feasibility of implementing music into patient care. In the current study, we developed an original questionnaire to characterize nurses' attitudes and current practices, and to explore the feasibility of implementing music as part of care for patients at an inpatient hospital setting.

The current study results revealed that the majority of nurses view the use of music in care as beneficial for patients and up to 89% of nurses have implemented music as part of their patient care. Most respondents reported music to be effective as a non-pharmacologic intervention for reducing pain, anxiety, agitation, and for improving mood. About 48% of the nurses who have implemented music into their care of patients do so on a weekly basis or more frequently. Nurses favored simple and quick, individual methods of implementation (e.g., streaming music for a patient, encouraging a patient to play music on the patient's own device, referring patients to the hospital's Arts in Medicine program) (Figures 5A and 5D). Unit streaming service accounts (e.g., Spotify, Pandora), lower nurse-patient ratios, education on music implementation, speakers or headphones in patient rooms, and private patient rooms were identified as key facilitators to nurses for implementing music. Most nurses rated each of

these facilitators as being at least very helpful for implementing music. No significant barriers were identified in responses to closed-ended questions. However, responses to open-ended questions further characterized barriers that prevent implementation of music in care and when these barriers are addressed, this may further enable nurses to be able to deliver music interventions as part of patient care.

In the first open-ended question, nurses pointed out limitations in the current equipment they use to implement music and made suggestions for equipment that could make implementing music easier (Figure 6). Nurses report using the music stations on the television in patient rooms, computers in patient rooms, the patient's personal devices, and the nurse's personal devices to implement music. Nurses reported that the selection provided by the music stations on the television in patient rooms was insufficient. Nurses also reported numerous concerns related to using computers in patient rooms to play music (i.e., privacy concerns when leaving computer unlocked, interruptions from advertisements, interruptions from the computer automatically logging the user out). Finally, using the personal devices of the patient or nurse for music interventions was reported to be unreliable, as the nurse can only implement music for one patient at a time. Additionally, not every patient has a personal device on which to play music. Expanding equipment available for nurses to use in implementing music into care may make music interventions more accessible to nurses, allowing more patients to benefit from the therapeutic effects of music. Some equipment suggested by nurses were streaming accounts available for nurses to use (i.e., Spotify, Pandora, Apple Music) and devices on which to play music (i.e., speakers).

Multiple studies have demonstrated that implementing music into care is cost-effective (Chlan et al., 2018; Gaviola et al., 2023). In addition, music intervention is easily accessible, non-invasive, and has little to no negative side effects (Hole et. al., 2015). Indeed, music interventions have been found to be effective in reducing anxiety and pain in preoperative and postoperative settings, reducing the need for analgesic, sedative, and anxiolytic drugs that

may have negative effects or result in prolonged hospital stay (Bradt & Dileo, 2014; Nilsson, 2008). However, while there are many benefits to the implementation of music into inpatient medical settings, music has limitations as a treatment modality. Music is meant to serve as an adjunct to traditional medical therapies and not as a substitute or a replacement for best practices or standard of care for all patients. Some patients may respond with more favorable clinical outcomes than other patients, and patient preference should be a consideration when attempting to implement music into patient care. While music has been shown to be associated with reduced pain (Lorek et al., 2023), it should be used in conjunction with other treatment approaches for moderate to severe pain (Chai, 2017). Music may also have some inadvertent effects. Some healthcare providers may find music to be a negative distraction, which could impact patient care or interfere with communication with the patient (Hole et al., 2015; Sonke et al., 2015). This may be especially true in the intraoperative setting, where music should be utilized conservatively.

The current study has several strengths including the collection and analysis of both quantitative and qualitative data. Collection of both quantitative and qualitative data allowed for a more nuanced analysis of facilitators and barriers and a better characterization of factors contributing to implementing music into nursing care. There was a large sample size and a diverse pool of participants. A few limitations include that this study was conducted at one academic medical center in the southeastern United States with an Arts in Medicine program, therefore, generalizability may be limited. However, Arts in Medicine programs are increasingly prevalent in the United States with nearly 50% of hospitals having some arts program, as of 2009 (Sonke et al., 2009). A second limitation is that a confirmatory factor analysis was not performed, however exploratory analysis was used to reduce the question pool. Finally, the MIC questionnaire was distributed on two separate occasions and since the survey was anonymous (participants were not asked for their names), therefore, it is possible that participants may have completed the questionnaire twice. However, attempts were made to mitigate multiple

submissions by using a feature in Qualtrics called “prevent multiple submissions” that was configured to prevent multiple responses from the same respondent. In addition, most participants provided their email address and the email addresses were checked for duplicate submissions.

The current study results are encouraging; most nurses were found to have positive attitudes toward music, strongly endorsing its utility in patient care, and many reported regularly implementing music. The results regarding nurse attitudes are consistent with a study that examined the attitudes of healthcare workers in general toward the use of music in care, which found that staff perceptions of arts interventions in hospital settings are mostly positive (Wilson et al., 2016). This was the first study to characterize attitudes, implementation of, and feasibility toward nurses implementing music in the care of their patients. In light of the facilitators and barriers characterized in this study, future research regarding the effectiveness of current equipment for nurses implementing music into patient care and the effectiveness of novel resources in implementing music (e.g., unit-provided streaming services, speakers or headphones in patient rooms) could be the next step to making music more accessible to patients. A similar study being performed at a hospital without an Arts in Medicine program might provide useful information on whether the presence of a hospital arts program increases the use of music in care at the hospital beyond the scope of the program itself.

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## APPENDIX

Music in Care questionnaire. Questions retained after exploratory factor analysis are bolded.

# Music in Care Questionnaire (MIC) - Full

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Q1 Title of Project: Music in Care by Nurses  
Principal Investigator: Kenneth Borick

Please read the information below before you proceed to participate in this study.

1. Purpose of Study: To develop a better understanding of the use of music in care by nurses.
2. Tasks: You will be asked a series of questions regarding your attitudes toward and use of music in patient care.
3. Time Required: 5-10 minutes.
4. Research Benefits: 10 participants will be randomly selected to win a \$25 prepaid debit card. If you would like to be considered for the drawing, please provide your email at the end of the survey.
5. Research Risks: No discomforts or risks to survey participants are expected.
6. Statement of Confidentiality: Your participation in this research is confidential. The researchers will not share your name or other identifiable information about you if they publish, present, or share the results of this research.
7. Research Contact: Please contact Kenneth Borick with any questions or concerns about this study at [borickk@ufl.edu](mailto:borickk@ufl.edu).

Participation in the survey implies that you have read the information in this form and consent to take part in the research. If you want to participate in this research study, click “I agree to participate and intend to complete the survey” below. If you do not want to participate, you may simply close this window or click “I do not wish to participate”.

- I agree to participate and intend to complete the survey.
- I do not wish to participate.

## Demographics

1. What is your age?

2. What is your gender?

- Male
- Female
- Other \_\_\_\_\_

3. What is your race or origin? (Check all that apply)

- Asian or Asian American
- Black or African American
- White, Caucasian, or European
- American Indian or Alaska native
- Native Hawaiian or other Pacific Islander
- Other \_\_\_\_\_

4. What is your ethnicity?

- Hispanic
- Not Hispanic

5. What is your highest level of educational achievement?

- Registered Nurse (RN)
- Registered Nurse with Bachelor of Science in Nursing (RN/BSN)
- Master of Science in Nursing (MSN)
- Doctor of Nursing Practice (DNP)
- Doctor of Philosophy (PhD)

6.1 How long have you worked as a nurse? (enter numbers only in text box)

6.2 Is your previous answer in months or years?

- Months
- Years

7. What patient population do you primarily work with? (Select option that best applies)

- Infant
- Children
- Adults
- Older Adults

8. Please select the category that best describes your unit

- Intensive Care Unit / Intermediate Care (ICU/IMC)
- Non-Intensive Care Unit / Non-Intermediate Care (Non-ICU/Non-IMC)

9. Which unit do you work on?

**Attitudes**

**For the statements below, please select the answer that most closely aligns with your opinion.**

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly Agree
<b>10. Implementing music into care has significant short-term benefits for patients.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Implementing music into care has significant long-term benefits for patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Implementing music into care has a negligible impact on the wellbeing of patients.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I feel confident in my ability to implement music into care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I feel I have sufficient time at my job to implement music into care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Implementing music into care is not worth the time required.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Patients desire music in care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Nurses have a place in implementing music into care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Music in care should be left to licensed therapists.

○	○	○	○	○
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Please rate how effective you think music can be for the following problems in patients on the unit at which you primarily work.

	Not at all effective	Slightly effective	Moderately effective	Very effective	Extremely effective
<b>19. Reducing level of pain.</b>	○	○	○	○	○
<b>20. Reducing level of anxiety</b>	○	○	○	○	○
<b>21. Improving satisfaction with care.</b>	○	○	○	○	○
<b>22. Improving a low mood.</b>	○	○	○	○	○
<b>23. Reducing level of agitation.</b>	○	○	○	○	○
24. Facilitating rest.	○	○	○	○	○
<b>25. Increasing relaxation during minor medical procedures (e.g., IV insertion)</b>	○	○	○	○	○

Please rate how willing you would be to implement the following music-based interventions.

	Extremely unwilling	Somewhat unwilling	Neutral	Somewhat willing	Extremely willing
26. Referring a patient to Arts in Medicine.	○	○	○	○	○
27. Suggesting a patient play music of their choice on a phone or another device.	○	○	○	○	○

**28. Streaming music for a patient on a phone or another device.**

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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29. Playing a musical instrument with a patient or for a patient.

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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**Feasibility**

**Please select the answer that most closely aligns with your opinion based on your experience on your primary unit.**

	Not at all effective	Slightly effective	Moderately effective	Very effective	Extremely effective
30. I have the time to implement music into care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>31. I have the equipment necessary to implement music into care.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Implementing music into care feels rewarding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>33. There is a system in place to assist nurses in implementing music into care.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>34. I have the necessary skills to implement music into care.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. My direct supervisor supports the use of music in care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rate whether or not the following changes would be helpful for implementing music into care.

	Not at all helpful	Slightly helpful	Moderately helpful	Very helpful	Extremely helpful
<b>36. Lower nurse-patient ratios.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>37. Further education on implementing music into care.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Instruments available to use on your unit.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>39. Speakers/headphones in patient rooms.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>40. Unit music streaming service accounts for nurses (e.g., Spotify, Pandora).</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. Recognition for nurses who implement music into care.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>42. More private patient rooms.</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Implementation

43. Have you ever used music in your care of patients (includes referring to Arts in Medicine)?

- No
- Yes

44. Choose the option that best fits how often you implement music into care

- On a daily basis
- On a weekly basis
- On a monthly basis
- Every couple of months
- On a yearly basis

45. Please estimate how many times you have used music in your care of patients.

- 1-10 times
- 11-20 times
- 21-30 times
- 31-40 times
- 41+ times

46. Check all options that describe ways in which you have used music in patient care.

- I have encouraged a patient to play music on their phone or another device.
- I have streamed music for a patient.
- I have played an instrument for a patient.
- Patient and I played an instrument together,
- I have referred a patient to Arts in Medicine
- Other \_\_\_\_\_

**Open-ended questions**

47. What changes are needed in the hospital that would make it possible for you to implement music into care?

[There is no word limit for this question]

48. Based on your experience as a nurse, what are your thoughts or concerns regarding the use of music in care for patients?

[There is no word limit for this question]

**Email collection for honorarium.**

You have reached the end of the survey. If you want to be considered for the debit card drawing, please enter your email address. Randomly selected participants will be contacted by email at the end of the survey. According to UF policy, those who are randomly selected may have to provide some demographic information to process to debit card.

\_\_\_\_\_