

“Where’s the Music?” Using Music Therapy for Pain Management

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Music therapy is readily available, low risk, inexpensive, requires little training, and may improve the patient experience.

Staff at the Malcolm Randall VAMC (MRVAMC) outpatient pain clinic in Gainesville, Florida, found that procedures to reduce a patient’s pain could initially cause pain and anxiety. Typical nursing care plans involved measures to reduce anxiety in patients undergoing interventional procedures expected to produce pain, including identifying and reinforcing coping strategies, providing reassurance and comfort, and giving patients clear explanations slowly and calmly. The MRVAMC nursing staff therefore also advocated to add music therapy to the existing plan.

BACKGROUND

As part of a quality improvement (QI) project, the authors conducted a literature search to find scientific

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evidence for the use of music therapy. Multiple medical databases were analyzed to find studies that included total time, dose of sedative medications, pain scores, patient experience, and willingness to repeat the same procedure in the future with use of music vs no music.¹ The literature review revealed that music therapy demonstrated effectiveness in decreasing anxiety and pain, supporting relaxation, reducing sedation medication during procedures, and improving patient satisfaction.

As a result of the literature search the authors conducted a prospective, randomized controlled study to investigate music therapy as an adjunct intervention during painful procedures.

Radiofrequency Lesioning

One of the more common (and most painful) procedures performed at MRVAMC is radiofrequency lesioning (RFL). The procedure uses electrical pulses to block nerves for pain relief. Using fluoroscopy, the physician inserts a needle adjacent to the nerve that innervates the facet joint. The sensory and motor nerves are stimulated, causing a tin-

gling or buzzing sensation and tapping. Once the tip of the needle is placed in the correct location, electrical pulses (small radiofrequency currents) are passed through the needle. A lesion is formed that temporarily interrupts the pain messages that the nerve sends to the brain. The procedure can take between 30 and 60 minutes, which is longer than most pain clinic procedures.

Radiofrequency lesioning controls pain caused by degenerative disc disease, facet arthropathy, sacroiliac joints, stellate ganglions, and other nerve conditions. Due to the length of the RFL procedure, patients may experience pain and anxiety (as well as other complications, such as vasovagal responses).

The clinic staff anticipated that there would be 20 RFL procedures scheduled per week and selected it as the study procedure for 3 reasons: procedure length, high level of pain, and frequency performed.

After receiving approval from the University of Florida Institutional Review Board and VA Research and Development, the MRVAMC pain clinic initiated the study from September

2013 to April 2014. The purpose of the study was to measure the effects of music on patient's self-reported anxiety and pain levels before and after nonsedating lumbar RFL.

METHODS

Study Design

Veterans aged between 21 and 88 years who were scheduled to return for lumbar RFL and who did not require sedation were invited to participate. Sixty participants consented. The music group had 21 men and 2 women. The no-music group had 19 men and 2 women. Table 1 summarizes descriptive data. Table 2 describes the results of the comparison analysis. Patients were randomly assigned to either the music intervention group or no-music group. Before and after the procedure, participants in both groups were queried on pain and anxiety levels, using a visual analog scale (VAS).

The study tools included the global anxiety VAS (GA-VAS) for pain and anxiety and a yes/no self-reported question, "Did music help?" for participants in the music group. Evaluation of the GA-VAS demonstrated reliability and validity and were patient friendly.^{2,3} Pain was recorded using a Likert scale of 0 for no pain and 10 for severe pain. Anxiety was recorded using a Likert scale of 0 for no anxiety and 4 for extreme anxiety.

Study subjects were recruited from patients who were on a maintenance lumbar RFL schedule, did not require sedation, and were willing to participate. If sedation was required, the patient was excluded from the study. Returning patients scheduled for RFL were informed about the music study and asked whether they were interested in participating. If they agreed, the study was explained in full, and informed consent was obtained prior to the day of their scheduled

Table 1. Patient Characteristics

Characteristics	Overall, % (n = 44)	Music, % (n = 23)	No Music, % (n = 21)	P Value ^a
Gender				.99
Female	9 (4)	9 (2)	10 (2)	
Male	91 (40)	91 (21)	90 (19)	
Mean age, y (SD)	57.6 (9.7)	56.8 (10.3)	58.4 (9.2)	.59
Race				.99
Black	16 (7)	17 (4)	14 (3)	
White	80 (35)	51 (18)	81 (17)	
Did not disclose	5 (2)	4 (1)	5 (1)	
Music preference				.19
No preference	2 (1)	0 (0)	5 (1)	
Easy	59 (26)	52 (12)	67 (14)	
Jazz	23 (10)	22 (5)	24 (5)	
Classical	16 (7)	26 (6)	5 (1)	

^aP value is derived from comparing groups.

Table 2. Comparison Analysis

Characteristics	Overall, % (n = 44)	Music, % (n = 23)	No Music, % (n = 21)	P Value ^a
Mean before procedure pain level (SD)	5.2 (1.9)	5.6 (1.9)	5.0 (1.9)	.14
Mean after procedure pain level (SD)	2.5 (1.9)	2.3 (1.9)	2.6 (2.0)	
Mean before procedure anxiety level (SD)	2.4 (0.9)	2.4 (1.0)	2.2 (0.9)	.27
Mean after procedure anxiety level (SD)	1.5 (0.8)	1.5 (0.9)	1.5 (0.7)	

^aP value is derived from comparing groups.

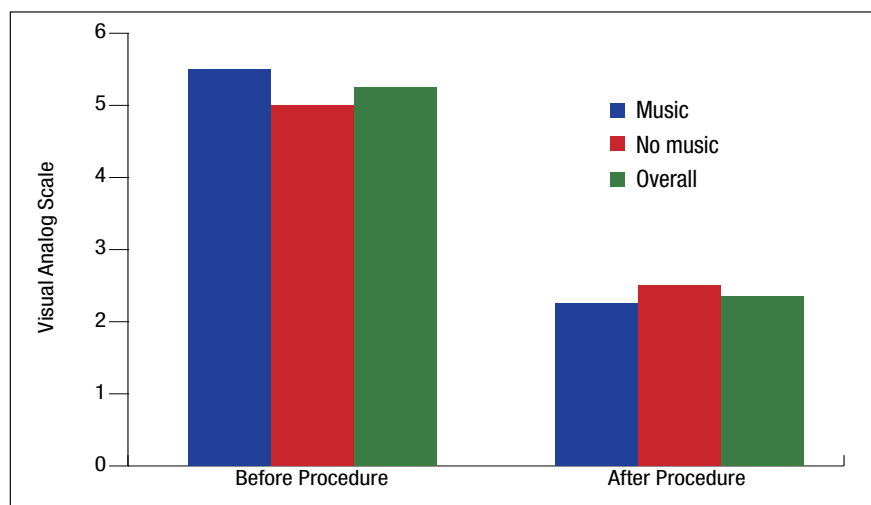
procedure. After obtaining informed consent, participants were asked to choose a music genre from 3 options: easy listening, jazz, or classical. Participants received a sealed envelope identifying their group (30 envelopes were created for each group) to be opened by the procedure nurse on the day of the procedure.^{4,5}

Sixty participants consented to participate in the study. Of these 60 patients, 44 were studied. The 16 patients who did not participate had either a change in procedure or did not show for the appointment.

Data Collection

On procedure day, all participants completed the anxiety scale as well as a VAS pain scale (which is the MRVAMC standard of care), preoperatively and postprocedure. Envelopes were opened prior to going into the procedure room to prevent prior knowledge of who was assigned to the music group. Participants in the music intervention group listened to their preselected music on a portable CD player in the procedure room. The music was played softly so the patient could still hear and respond

Figure 1. Mean Pain Score on Visual Analog Scale Before and After Procedure



to the physicians instructions during the procedure. The no-music group received everything that the music intervention group received except for music (standard care throughout procedure, which consisted of nurse monitoring, measures to reduce fear and anxiety, and comfort measures). Procedures were performed with local anesthesia; neither group received moderate sedation.

Gender, age, and self-reported pain scores (before and after the lumbar RFL procedure) were recorded in the patient's chart and entered into the study database. Patients in both groups were queried before and after the procedure using the VAS to measure their pain and anxiety levels. Participants in the music intervention group were asked whether they felt that the music helped. They also were asked to provide feedback about their experience. Data were stored in locked filing cabinets, and all forms were de-identified.

Statistical Analysis

SAS version 9.2 (Cary, NC) was used for all analyses. Data were inspected for out-of-range values. The

Fisher exact test was used to compare groups on categorical measures. An independent sample *t* test was used to compare groups on the age variable. Difference scores (formed by subtracting the after score from the before score) were analyzed using paired *t* tests. Analysis of covariance was used to test for significant group differences on the outcome variables of pain and anxiety with group as the independent variable and the preprocedure measure as the covariate. The level of significance was set at .05, and all testing was 2 sided.

RESULTS

Of the 60 consenting patients, 44 participated in the study. Twenty-three were randomized to the music intervention and 21 to the no-music control group. Both pain and anxiety were significantly reduced ($P < .0001$) in the total sample ($n = 44$). The mean (SD) decrease in pain for all participants was 2.80 points (2.31) on a VAS of 0 to 10 and 0.86 points (0.93) decrease in anxiety. In the music intervention group, the mean decrease in pain and anxiety was 3.22 (2.66) and

1.00 (0.85), respectively. In the no-music group, the mean decrease in pain and anxiety was 2.33 (1.80) and 0.69 (1.00), respectively. The magnitude of pain decrease was larger in the music intervention group; however, the difference did not reach statistical significance.

DISCUSSION

Although there was not a statistically significant difference in pain or anxiety reduction due to group assignment, a 2-point reduction in self-reported pain or anxiety may be considered clinically important and has been supported in older studies.⁶ Importantly, 87% of participants in the music intervention group reported that listening to music was helpful during the procedure (Figure 1).

Anxiety levels were not as high as expected when measured before and after the procedure, perhaps due to improvements in patient education and continuity of care (Figure 2). Since all participants were returning patients, they already were familiar with the procedure and the staff. Staff turnover rate is very low at this clinic, which may have contributed to the low anxiety rates among participants at baseline. Other contributing factors included good communication, expert technique, and teamwork.

During the study, few negative comments were noted. One participant did not hear the music due to faulty equipment setup. Another participant commented that the physician doing the procedure made negative remarks about the music the patient selected. A third participant commented that the music was too loud, and he was unable to hear the doctor's instructions, indicating a need for guidelines.

There were many positive comments by participants in the music intervention group. Nurses reported comments such as “The music really helps”; “The music was great, but rock ‘n’ roll would be better”; and “Can I bring my own [music] next time?” Many patients returning for procedures frequently asked, “Where is the music?”

Limitations

Of the 60 consenting patients, only 44 participated, possibly lowering the power of the study to detect significant findings. During the study, the physician staff was reduced, resulting in fewer RFLs performed and causing the study to take longer to conduct and with fewer opportunities to recruit participants.

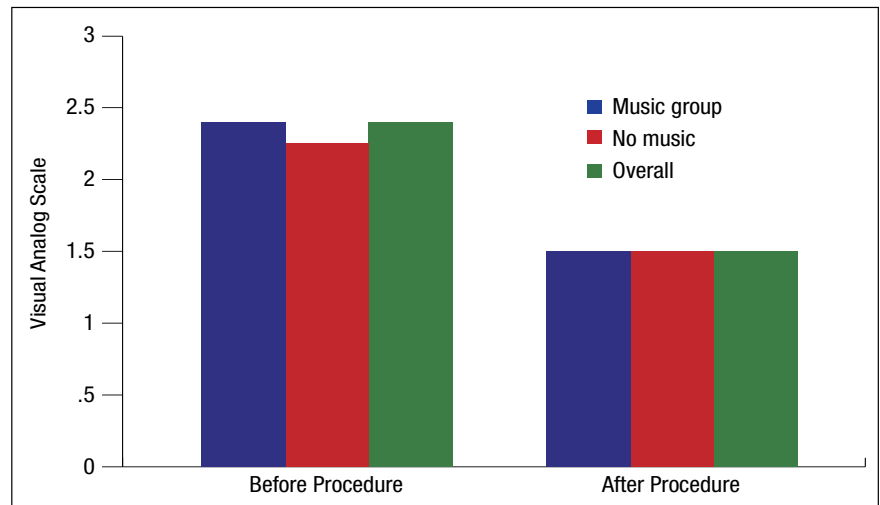
The CD players used for the study were old, and because earbuds could not be used, volume was difficult to modulate consistently. Earbuds were not used because patient participation was required during the procedure. Also, having only 3 music genres to choose from limited the participant’s choice.

CONCLUSION

Research supporting the use of music therapy to increase patient comfort is widely accepted and practiced.⁷ Music therapy is readily available, low risk, inexpensive, and does not require intense training by staff. It may reduce the need for moderate sedation and improve the overall patient experience. During the study, the MRVAMC nursing staff gained a greater appreciation of evidence-based practice; staff are more engaged in QI, based on their personal involvement in research.

Because 87% of the music therapy participants reported that music was helpful, the MRVAMC pain

Figure 2. Mean Anxiety Score on Visual Analog Scale Before and After Procedure



clinic plans to implement music therapy as a standard of care during RFL procedures and all procedure appointments. Music therapy may help reduce pain and anxiety during painful procedures. The goal is to continually increase patient satisfaction and overall procedure experience through integration of evidence-based practice. ●

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