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THE EFFECTS OF MUSIC IMAGERY RELAXATION IN MEDICAL SETTING

Abstract:
This presentation reports a pilot study completed at the Health Alliance of the Hudson Valley (HAHV) in Kingston, NY. It includes patients recovering from orthopedic surgery who received music therapy treatment within 36 hours post-surgery. This study followed a randomized controlled trial design; 31 patients were assigned to either the control or the experimental group. The experimental group received music and imagery therapy treatment while the control group did not. The technique used is called Music/Imagery Induced Relaxation (MIR), an adaptation of the Bonny Method, which uses the patient's experience of wellbeing to induce relaxation while the patient listens to preferred music. A statistical analysis of the data was conducted using a Repeated Measures t-test. Independent variables included the music used in each session, which varied according to client preferences and imagery. Dependent variables included level of pain and anxiety as well as physiological measures of heart rate and blood pressure. Results indicated a significant decrease in the level of pain after music therapy treatment, while anxiety reduction approached significance. Statistical significance was found for systolic blood pressure from pre to post session, while diastolic blood pressure approached significance following the music treatment. After the session, each client responded to a satisfaction survey, and the results show that all participants had a positive experience. The music therapy treatment indicates that music and guided imagery improved outcomes, whereas receiving no music therapy treatment did not improve any of these outcomes.

Keywords: music, imagery, guided, relaxation, Bonny Method adaptation, medical

Introduction
Anxiety and pain are perhaps the most frequent and pressing psycho-physiological problems that patients present after surgery. The stresses of being in a hospital and the unfamiliarity of the setting can cause patients to experience anxiety. In addition, the uncertainty about the outcome of the surgery combined with a pending recovery period can leave anyone feeling anxious and insecure (Johnston, 1980). Anxiety is a natural response.
to a perceived threat or danger. For the purpose of this study, surgery is the perceived threat. Although surgery is beneficial and often times necessary, patients tend to feel nervous about the procedure itself. Anxiety causes many physiological symptoms, e.g. tightness in the chest, difficulty breathing, sweating; as well as emotional distress, e.g. feeling tense and nervous (Frey & Odle, 2006). These symptoms can actually slow down the recovery process. Research has shown that patients with lower anxiety levels can recover faster from medical procedures (Madson & Silverman, 2010). The use of alternative treatments, such as music therapy, can help reduce anxiety levels without the use of medication (On Kei, Yuet, Moon, & Wai, 2005). Several studies have shown the positive effects of music and relaxation as a treatment to reduce pain and anxiety (Good, Ahn, Cong, & Stanton-Hicks, 2005; Madson & Silverman, 2010; Li, Zhou, Yan, Wang, & Zhang, 2012). Each study was executed to see the responses of patients to music before and after a medical procedure, and each showed significant reduction in pain and anxiety levels in the treatment group (Good et al., 2005; Madson & Silverman, 2010; Li et al., 2012). One method of music therapy, called the Bonny Method of Guided Imagery and Music (BMGIM), has proven to be very successful in reducing anxiety levels (Beebe & Wyatt, 2009). The BMGIM is a music therapy technique that was developed by Helen Bonny in the early 1970's at the Maryland Psychiatric Research Center (Bonny & Savary, 1973). Goldberg (1995) stated that this technique is considered unique in music therapy because it uses music to create an altered state of consciousness in order to further the patient's own understanding of him/herself (as cited by Beebe & Wyatt, 2009). It consists of four phases: (a) preliminary discussion; (b) induction; (c) music-listening period, and (d) post-session integration. The session generally lasts for 1.5 hours (Bonny, 1978). Through this process, clients are given the opportunity to get an introspective look into their own imagery, helping them to explore problems, issues, and strengths. Through this inner-personal exploration, clients can confront and conquer the root of their anxiety, resulting in a higher state of relaxation (Ventre, 2002).

Several authors have reported adaptations of the BMGIM since Helen Bonny first developed it. The literature suggests variations, such as duration of the music, selection of the music, and bodily position during the music listening (Gimeno, 2010; Goldberg, 1998; Picket, 1996-1997; Short, 1991; Summer, 2002; West 1994). Goldberg (1994) recommended the use of music with a narrow range to allow a very brief imagery experience without the dynamic unfolding that is characteristic of a standard session. Blake (1994) suggested a short duration of music (no longer than 10 minutes) in a new age or classical style. She also recommended having the client in a sitting position rather than lying down on a couch, as is the case of a regular BMGIM session. Summer (2002) referred in her study to the importance of giving supportive therapy when clients need to be held to reinforce any positive feeling that might emerge during the session. In the same study, she encourages the use of task-oriented inductions as opposed to one induction that encourages exploration. She cites examples where the direction is to create a safe place or to provide a relaxing image that holds the client in a calm and positive feeling. Summer (2002) states that an induction should clearly present a self-affirming image rather than a conflictive one. A positive image allows for increased feelings of safety and good self-esteem.

In the current study, the investigator is looking at an adaptation of BMGIM called Music Imagery Relaxation (MIR). MIR is a shorter session, generally 30 minutes, and the imagery goal is to relax the body and mind. It uses the concept of music and imagery in
order to give patients the tools to reflect inwardly and conjure up positive images, promoting relaxation and decreasing anxiety (Gimeno, 2015). The purpose of this study was to take an in-depth look at whether MIR could reduce pain and anxiety of patients who had received orthopedic surgery. The aims of the study were that patients in the experimental group receiving MIR treatment would have a larger reduction of pain and anxiety than the ones in the control group. Additionally, the psychological measures of heart rate and blood pressure would be reduced after the music therapy treatment. Indeed, music therapy researchers identify music therapy uses in the alleviation of pain and anxiety as perhaps the most effective use of music therapy in the field (Bernatzky, Presch, Anderson, & Panksepp, 2011).

Methodology

This study was conducted at the HAHV in Kingston, NY. The participants were patients who had had orthopedic surgery, which included hip and knee replacement. A total of 31 Caucasian patients participated in this pilot study. Participants were randomly assigned to either the experimental or the control group. The criteria for inclusion was as follows: the patient must (a) undergo orthopedic surgery including knee or hip replacement; (b) be between 18-75 years of age; (c) be able to read and understand English and/or Spanish; (d) have no history of acute psychiatric illness; and (e) have adequate mental/cognitive functioning.

Recruitment

This study was addressed to English as well as Spanish speaking patients. However, only English speaking Caucasian patients were available. Prospective participants were informed of the study at a meeting that was held on Mondays to inform patients about their upcoming orthopedic surgery. The researcher took the last five minutes of this meeting to inform the patients about the study and the criteria for inclusion. Patients who volunteered to participate and met the criteria signed a consent form at this meeting, while others signed it at a later time, after they made the decision.

Research Design

This study followed a randomized controlled trial design with an experimental and a control group. The experimental group received music and imagery treatment while the control group received standard care only. There were four dependent variables collected both before and after the MIR treatment intervention. The statistical analysis used in this study was completed using Repeated Measures t-tests for the dependent variables of pain, anxiety, heart rate and blood pressure, to determine whether there was a statistical significance before and after music and imagery treatment for the experimental group. For the control group, the same time frame was used to take measurements to test for statistical significance. Experimental treatment conditions were guided imagery and music. Participants received one session of MIR within 36 hours after a hip or knee replacement. Participants responded to a satisfaction survey once the session ended.
Table 1
Repeated Measures Design: Two groups, Random Selection, Pre-test, Post-test

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
<th>End of X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group = E (R)</td>
<td>O1</td>
<td>X</td>
<td>O2</td>
<td>SS</td>
</tr>
<tr>
<td>Control group = C (R)</td>
<td>O1</td>
<td>O2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Symbol SS = Satisfaction Survey

Variables Studied

Independent variables were music and imagery. The music used within each treatment session consisted of the participants’ preferred music. The length of each musical selection varied between eight and ten minutes. The imagery used was based on what the participant reported during the prelude phase regarding a memory of experiencing well-being. Dependent variables were the level of pain and anxiety, and physiological measures of heart rate and blood pressure.

Procedure

Demographic information on the participants was collected, which included gender, age, ethnicity, primary language (spoken/written), and type of orthopedic surgery. In addition, pre- and post-tests on levels of pain and anxiety, as well as physiological measures of heart rate and blood pressure were taken. At the end of the music therapy treatment, every participant responded to a satisfaction survey. Each participant in the experimental group received one MIR session within 36 hours after surgery. The purpose of the MIR technique was to induce relaxation, helping the participant to be in touch with a positive inner experience through music and imagery while in an Altered State of Consciousness (ASC). The session lasted for approximately 30-40 minutes.

The MIR treatment consisted of four phases:

(1) The first phase is called Prelude. During this time, a therapeutic rapport was developed by discussing an experience of well-being that was known to the participant.

(2) The second phase is called Induction. During this time, the researcher provided a brief relaxation exercise in transitioning to the ASC.

(3) The third phase is called Music Listening. During this time, the participant was engaged in listening to eight to ten minutes of preferred music while the researcher was verbalizing a script elaborated from the participant’s reported experience of well-being. At this stage all the senses were utilized to intensify the imagery, making it as vivid as possible for the participant to revisit the experience.

(4) This last phase is called Process, which involved the processing of the experience they just had (Gimeno, 2015).

Data Collection

The data collected included: (1) the level of anxiety pre and post-treatment measured using a Visual Analog Scale (VAS) with anchors from 0-100 millimeters; (2) physiological
measures of heart rate (HR), and blood pressure (BP) which were recorded by the nurse in charge using a portable monitor pre and post-treatment. At the end of the session, the participants in the experimental group received an envelope containing a satisfaction survey that consisted of five questions, and completed their surveys at their convenience within the next hour. Participants in the control group received a complimentary session of MIR after all data was collected.

Results

The sample for this study included 15 men and 16 women with a mean age of 65 years (44-75). Results from the experimental group indicated that heart rate showed a significant improvement following music and imagery treatment (p=0.01). In regards to blood pressure, the systolic showed a significant improvement following music and imagery treatment (p=0.03), while the diastolic showed improvement that approached significance (p=0.06). The VAS for pain showed a significant improvement following music and imagery treatment (p=0.01), while anxiety showed improvement that approached significance (p=0.06). In the control group, heart rate significantly worsened following no treatment (p=0.01). No other measure showed statistically significant change. In conclusion, MIR treatment improved outcomes, whereas standard treatment alone did not improve any outcomes.

Table 2

Mean scores, standard deviation and p value for the dependent variables in both groups

<table>
<thead>
<tr>
<th>Factor</th>
<th>Experimental Group Pre-test Mean (SD)</th>
<th>Experimental Group Post-test Mean (SD)</th>
<th>p</th>
<th>Control Group Pre-test Mean (SD)</th>
<th>Control Group Post-test Mean (SD)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeartRate</td>
<td>84.38 (16.4)</td>
<td>76.13 (11.3)</td>
<td>0.01</td>
<td>73.94 (11.2)</td>
<td>77.8 (11.1)</td>
<td>0.01</td>
</tr>
<tr>
<td>Systolic Blood Pressure</td>
<td>127.25 (17.9)</td>
<td>121.19 (11.5)</td>
<td>0.03</td>
<td>127.69 (21.5)</td>
<td>129.13 (18.8)</td>
<td>0.65</td>
</tr>
<tr>
<td>Diastolic Blood Pressure</td>
<td>65.31 (9.3)</td>
<td>60.19 (7.5)</td>
<td>0.06</td>
<td>66.88 (12.9)</td>
<td>70.19 (11.6)</td>
<td>0.33</td>
</tr>
<tr>
<td>Visual Analog Scale _P</td>
<td>4.44 (2.7)</td>
<td>1.88 (2.1)</td>
<td>0.01</td>
<td>3.88 (2.2)</td>
<td>3.63 (2.6)</td>
<td>0.56</td>
</tr>
<tr>
<td>Visual Analog Scale _A</td>
<td>7.38 (11.7)</td>
<td>1.38 (2.0)</td>
<td>0.06</td>
<td>2.75 (3.2)</td>
<td>3.00 (3.1)</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Descriptive Analyses on Perception of Patients' Benefits

The following results pertain to the participants' perceptions of the benefits of MIR treatment. When observing the percentages of the surveys, it is noted that all participants (100%) reported positively to the five questions listed: (1) do you feel that the music with imagery session was helpful in promoting relaxation? Y/N; (2) do you feel less anxious after the session? Y/N; (3) was your imagery pleasant while listening to the music? Y/N; (4) did you like the choice of music? Y/N; (5) would you like to have another session of this type? Y/N.

Discussion

Results of this study showed statistical significance and validated the benefits of the MIR technique to induce relaxation. This was a mixed method study wherein both the
quantitative and qualitative measures show the success of this technique. This is the first
time that this technique has been tested, and the results are promising. It would be
interesting to do experiments using this technique on larger pools of participants, patients
with different diagnoses, different demographics and cultures, and so on. I think that this
technique can also be successfully applied in other settings outside of hospitals, and am
interested in the possibility of using this technique with children, which would involve
figuring out the best adaptations of the treatment to use depending on the various stages of
childhood development.

Two components of this study seem to be important to its success in distracting patients
from their pain and anxiety: (1) the use of preferred music, no matter what type of music the
patient requested; and (2) revisiting an experience that was enjoyable for the patient, and
at the same time deeply personal and poignant. Allowed to choose whatever music they
preferred, even if it wasn’t what we would typically consider music to induce relaxation,
patients were more easily able to connect to the treatment on a very personal level. And in
doing so, participants were able to revisit remembered experiences that they owned
personally.

For example, there was a case of a patient who chose rock and roll music. Some may think
that this type of music would not relax someone. But this patient depicted a memory of a
time in which he was on a camping trip with his granddaughters, listening to this music in
the background, and roasting marshmallows over the fire. The effects of this music in this
case helped him to really connect with this experience to revisit it.

Previous research supports the idea that the way we think affects our physiological body
responses, our mood, and our experience of pain and anxiety (Frey & Odle, 2006). We can
see these same dynamics in the current study, where a positive memory impacts the body's
physiological responses and the patient’s experience of pain and anxiety. Further research
needs to be done to find out exactly what in the brain is being activated and/or altered when
music is used to induce a positive memory, as opposed to the memory being experienced
without music. A comparison may be able to be drawn between this topic and the recovery of
patients with traumatic brain injuries, where we see the brain creating new pathways and
healing damaged ones in order to recover from the injury (Archibald, Hutton, Clarke,
Mosimann, & Burn, 2013). This finding has led to the possibility of exploiting this
connection in order to strengthen new connections for no longer functioning pathways.

The experience of being in a hospital, especially with life threatening ailments, can be
extremely traumatic to a patient, affecting the brain's function. Worries in regards to
medical diagnosis and prognostic, ruminating on negative thoughts, in an environment
that is unfamiliar, uncomfortable, and removed from all of the things that the patient
associates with the positive memories of his/her life, can be seen as injuring the brain. Can
music play an important role in helping to heal the worries of the mind? The current study
shows that the use of listening to preferred music in and ASC paired with a script of a
personal wellbeing experience, has the ability to quickly and effectively switch patients out
of their negative feelings and into a vivid, positive memory.

This experiment is well supported by The Gate Control theory of pain, developed by Ronald
Melzack and Patrick Wall in 1965. The theory asserts that non-painful sensory input,
known as “non-noxious stimuli,” can “close the gates” to painful input, impeding the
sensation of pain from entering into a person's consciousness via the central nervous system (Mendell, 2015). In the case of this study, we can consider the components of MIR, the preferred music and the story script, the non-noxious stimuli that prevent pain from being experienced. It would be of interest to do research in collaboration with other disciplines, such as neuropsychology, exploring how music actually alters the brain function during experiences such as MIR. I am also curious to see if a patient, given a recording of preferred music and a personal script, can be trained at home to cope with pain and anxiety.

Furthermore, music therapy research has shown the benefits of intervention for relaxation in a hospital setting. For example, the study by Good et al., (2005) shows that teaching music and relaxation techniques to patients helps to decrease their pain after intestinal surgery. But there is no research in my awareness that shows the patient's own, personal imagery, with preferred music, having such effects. This personal ownership of imagery is at the core of the Bonny Method of GIM. MIR is an adaptation of the Bonny Method, and shares this core with it. To conclude, this experiment offers some valuable results for best practices and music therapy research protocols.

References


