Complementing Relaxation Music for Pain During Dialysis
Jessie L. Brown, Lona D. Mahaseth, & Lauren M. Norton

This paper was written for Dr. Sauter’s Nursing 4432 course.

Background: Renal dialysis has become the treatment of choice for patients with end-stage renal disease. These patients expect to experience pain during and after access is obtained to their graft. Therefore, prescriptive therapy of listening to calm, relaxation music after renal-dialysis access is being developed, used and tested.

Objectives: The purpose of this study was to examine the physiological effects of relaxation music on patients undergoing dialysis treatment.

Methods: A randomized partially controlled study was conducted on 26 participants to examine the relationship of relaxation music and acute pain. These patients were randomly assigned to a control group or experimental group to assess pain, blood pressure, pulse and respirations within three minutes of access to the graft. After 30 minutes of listening to relaxation music or having no intervention these vital signs were re-assessed to note the correlation between relaxing music and pain.

Results: Pain reduction was reported in 23% of the experimental group, as compared to 12% of those in the control group. In the experimental group 65% of participants had a reduction in systolic blood pressure, 73% had a reduction in pulse rate, and 54% had a reduction in respirations. In the control group 77% had a reduction in systolic blood pressure, 61% had a reduction in pulse rate, and 31% had a reduction in respirations.

Discussion: This is one of the few studies that have been conducted to investigate the relationship of pain and relaxing music on renal dialysis patients. Understanding that pain increases blood pressure, pulse and respirations is critical to the nurse in promoting relaxation techniques to help the overall well being of the patient not only in the dialysis setting but also in other hospital and acute care settings.

Several studies have been conducted to examine the patient’s perception of pain. The traditional measures to treat pain after procedures have normally been opioids and analgesics, but they have not been completely effective because clients still report pain after medications are given. Non-pharmacological measures have been implemented to aid in the reduction of pain. Calm music can aid in decreasing a person’s pain, pulse, respirations...
and blood pressure. It also benefits the patients emotionally, psychologically as well as physiologically. Non-pharmacological nursing interventions, such as music therapy, benefit clients and help them by causing a decrease in pain, anxiety and distraction from the pain site. In a previous study conducted by Good, Anderson, Ahn, Cong, and Hicks (2005), it was suggested that music therapy aids in the reduction of pain after surgery. The results indicated that relaxation music provided a distraction and reduction in pain. The patients reported a sense of control over their pain when using relaxation music.

In a similar study, Good, Albert, Anderson, Wotman, Cong (2010), examined the effects of patient teaching, along with relaxation music and relaxation techniques, on the patients' experiences with pain post-surgically. This study suggested that those who received both patient teaching and relaxation music showed a significant reduction in pain. Therefore, it can be concluded that relaxation music had an effect on reducing pain. Overall, the results obtained from this study were consistent with those of previous research. Both studies revealed a direct correlation between prescriptive therapy and the reduction of pain. The results from both studies indicated that patients reported a reduction of pain after receiving non-pharmacological measures, such as relaxation music therapy. With the examination of the results of previous research, the question remains whether these results will be consistent in other clinical settings.

The theoretical framework that was modified for this study was Huth and Moore’s (1998) Prescriptive Theory of Acute Pain Management in Infants and Children. This theory examined the effects of prescriptive therapy on pain management in children. The framework for this study was designed to focus on the multiplicity of sensory pain, through the visual analog scale and initial vital signs and measure individual’s responses to pain through vital sign assessment. By using this framework the relationship between relaxation music and the reduction of pain in the dialysis setting may be identified.

The concern with many patients is that they expect to have pain in a clinical setting during treatment. More often than not, dialysis patients endure pain during and after access to their graft or AV fistula. Pain increases pulse, blood pressure, and respirations, which may affect mobility and activities of daily living. The purpose of this study was to determine if relaxation music decreases sensory pain. In previous research, 96% of patients reported that the prescriptive therapy of relaxation music was helpful for pain and 64% reported a reduction in pain (Good et al., 2010). Therefore, the aim of this study was to identify the relationships between relaxation music and the experiences of pain.

The research hypothesis in this study was that patients in dialysis with acute pain who listened to relaxation music would have less pain than those who did not listen to the relaxation music. The research question being
examined was ‘How is pain perceived by the patient?’ The independent variable in this study was the relaxation music of the patient’s choice. The dependent variables were blood pressure, pulse, respirations, and subjective pain rating by the patient.

This study was conducted in a partially controlled setting at West Georgia Dialysis Center in LaGrange, Georgia. Permission to use this site was granted from the Hospital Review Board. The type of design used was a comparative descriptive design that “examined differences in variables in two or more groups that occur naturally in a setting” (Burns & Grove, p. 244). A random sample was selected, and participants were placed into an experimental group or control group. The experimental group received music therapy and the control group did not. From a list of patients provided by the dialysis nurse, every fourth person was selected into the experimental group. The others were placed in the control group. Each participant met the following criteria; able to hear and speak English, deemed cognitively intact by the Short Portable Mental Status Questionnaire (SPMSQ), and be receiving renal-dialysis for kidney failure. Once each participant was selected, an explanation was provided on the context of the study and the role of the participant was explained. To protect the individual’s rights, each participant was informed as to the nature of this study and signed an informed consent. Each participant was then assigned a specific number code to protect confidentiality. The only people with access to the code sheets were the researchers and the faculty sponsor. These codes were locked in a cabinet in the nursing department. After each participant agreed to take part in the study, they were asked to complete the SPMSQ. The SPMSQ screens patients for cognitive ability. This tool was created by Pfeiffer (1975), and permission to use the SPMSQ was received. The SPMSQ is a ten item questionnaire that is used to assess the cognitive level of each participant. All patients who were deemed to be cognitively intact, who missed no more than two of the ten questions and could communicate in English were eligible to participate in this study. The participants were studied for approximately four to six weeks. Any patients not meeting all of the inclusion criteria were disqualified.

Other measurement instruments used were the visual analogue scale for sensory pain, recorded vital signs, and a sphygmomanometer, for measuring blood pressure. The visual analogue scale used was a scale ranging from no pain to pain as worse as it can possibly be which “is a line that is 100 cm long, with a right angle that ‘stops’ at either end” (Burns & Grove, p. 390). This scale is labeled on either end as ‘No pain’ or ‘Pain as bad as it can possibly be’. With this tool the patient easily rated sensory pain. Another tool used was a sphygmomanometer to measure blood pressure. Additional measures included counting radial pulse and respirations before
and after receiving 30 minutes of relaxation music.

Prior to beginning each day, radial pulse and respirations were assessed and a blood pressure reading was obtained prior to the nurse getting access to the graph. Within three minutes after access, the participant rated his/her pain on the visual analogue scale. The student nurse researchers measured radial pulse and respirations along with obtaining a blood pressure reading and then again re-assessed in 30 minutes. For the following treatment days, the same steps mentioned for assessment were obtained before and after access. After blood pressure, pulse, respirations and pain were measured for the first time, the experimental group was given a CD player to listen to their selection of music for 30 minutes. After 30 minutes vital signs were re-assessed. For the control group, no musical interventions were given. The same interventions were repeated until completion of the study which lasted approximately four weeks.

Data collection was analyzed by the student nurse researchers. Each student nurse researcher carefully examined the findings. A comparison of the data was made to see if there were decreases or increases in the dependent variables of pain and vital signs for both groups. Each member cross checked each other for correctly recorded responses during data collection. Data was analyzed using measures of central tendency and looking at the percentage of patients responding to interventions in a positive or negative way. Baseline data was compared to intervention data to determine responses to relaxation music for the experimental group and for the control group.

Our results showed that 23% of patients in the experimental group reported reduction in pain as opposed to 12% in the control group. Vital signs were also reduced in both groups. In the experimental group 65% of participants had a reduction in systolic blood pressure, 73% had a reduction in pulse rate, and 54% had a reduction in respirations. In the control group 77% had a reduction in systolic blood pressure, 61% had a reduction in pulse rate, and 31% had a reduction in respirations. Taking this into consideration, patient reported pain was the main form of individual data used to determine the effects of the relaxation music.

Results of this study indicated that relaxation music was an effective non-pharmacological method of reducing pain in dialysis patients. From this knowledge base, nurses can use relaxation music as an intervention to reduce patient pain. Relaxation music should be considered for use in pain reduction in other clinical settings as well.
References

Appendix
Tools and Measurements of Music Therapy

The following charts have been attached to provide an example of the tools and forms used to support this study.
   Appendix A: Visual analogue scale
   Appendix B: Short portable mental status questionnaire
   Appendix C: Permission email per Dr. Pfeiffer
   Appendix D: Hospital review board approval form
Appendix D

How severe is your pain?

No pain

Pain as bad as it can possibly be
### Short Portable Mental Status Questionnaire (SPMSQ)

**Patient's Name:** _____________________________  **Date:** __________________________

<table>
<thead>
<tr>
<th>Circle Appropriate Description</th>
<th>SEX: M F</th>
<th>RACE: White Black Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRS OF EDUCATION:</td>
<td>Grade School High School Beyond High School</td>
<td></td>
</tr>
</tbody>
</table>

**Instructions:** Ask questions 1 to 10 on this list and record all answers. (Ask question 4a only if the subject does not have a telephone.) All responses must be given without reference to calendar, newspaper, birth certificate, or other aid to memory. Record the total number of errors based on the answers to the 10 questions.

<table>
<thead>
<tr>
<th>+</th>
<th>Questions</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What is the date today?</td>
<td>Correct only when the month, date, and year are all correct.</td>
</tr>
<tr>
<td>2.</td>
<td>What day of the week is it?</td>
<td>Correct only when the day is correct.</td>
</tr>
<tr>
<td>3.</td>
<td>What is the name of this place?</td>
<td>Correct if any of the description of the location is given.</td>
</tr>
<tr>
<td>4.</td>
<td>What is your telephone number?</td>
<td>Correct when the number can be verified or the subject can repeat the same number at a later time in the interview.</td>
</tr>
<tr>
<td>4a.</td>
<td>What is your street address?</td>
<td>Ask only if the subject does not have a telephone.</td>
</tr>
<tr>
<td>5.</td>
<td>How old are you?</td>
<td>Correct when the stated age corresponds to the date of birth.</td>
</tr>
<tr>
<td>6.</td>
<td>When were you born?</td>
<td>Correct only when the month, date, and year are correct.</td>
</tr>
<tr>
<td>7.</td>
<td>Who is the president of the United States now?</td>
<td>Requires only the correct last name.</td>
</tr>
<tr>
<td>8.</td>
<td>Who was president just before him?</td>
<td>Requires only the correct last name.</td>
</tr>
<tr>
<td>9.</td>
<td>What was your mother's maiden name?</td>
<td>Needs no verification; it only requires a female first name plus a last name other than the subject's.</td>
</tr>
<tr>
<td>10.</td>
<td>Subtract 3 from 20 and keep subtracting 3 from each new number, all the way down.</td>
<td>The entire series must be performed correctly to be scored as correct. Any error in the series—or an unwillingness to attempt the series—is scored as incorrect.</td>
</tr>
</tbody>
</table>

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**Total Number of Errors**

- **0 – 2 errors = Intact Intellectual Functioning**
- **3 – 4 errors = Mild Intellectual Impairment**
- **5 – 7 errors = Moderate Intellectual Impairment**
- **8 – 10 errors = Severe Intellectual Impairment**

(Allow one more error for a subject with only a grade school education. Allow one less error for a subject with education beyond high school. Allow one more error for African-American subjects, using identical educational criteria.)

**Source:**
Given your student status, you are hereby given permission to use the instrument without any charge. Eric Pfeiffer, M.D.

Eric Pfeiffer, M.D.
Founding Director, Eric Pfeiffer Suncoast Alzheimer's Center
University of South Florida College of Medicine
3120 W. Hawthorne Rd., Tampa, FL 33611-2901
Tel.: 813-839-5769, Cell Phone 813-810-0235
Website: ericpfeiffermd.com

From: Mahaseth, Lona D. [ldmahaseth@lagrange.edu]
Sent: Tuesday, November 30, 2010 11:14 AM
To: Pfeiffer, Eric
Subject: RE: Requesting permission to use the SPMSQ

Dr. Pfeiffer,

We are pleased that you have given us permission to use your tool and appreciate that you think it is appropriate for our study. However, we are undergraduate nursing students and have no funding for our research project. We would be able to share our findings with you if you'll allow us to use your tool at no charge. Would you consider allowing us to use your tool at no charge?

Sincerely,

Lona Mahaseth

From: Pfeiffer, Eric [mailto:epfeiffer@health.usf.edu]
Sent: Mon 11/29/2010 4:31 PM
To: Mahaseth, Lona D.
Subject: RE: Requesting permission to use the SPMSQ

Dear Ms. Mahaseth: Thank you for your interest in using the Pfeiffer SPMSQ in your nursing research project.

It would appear that the instrument is appropriate for the specific use you have in mind. Accordingly, permission is hereby granted for you to use the SPMSQ in your research project, contingent upon payment of a one-time use fee in the amount of $100.00. My invoice for the payment is attached. Also, please find attached a copy of the SPMSQ which you may either copy as is or reformat it for use in your research project.

Please acknowledge receipt of this e-mail, along with the attachments mentioned, and indicate if this arrangement is agreeable to you. You may make payment either by your personal check or by a check issued by your educational institution.

As a courtesy, but not as a condition of your use of the SPMSQ, I would be grateful if you could let me know if you have found the instrument useful in your work, or to share any publications as a result of this work.

Sincerely yours, Eric Pfeiffer, M.D.
From: Mahaseth, Lona D. [lmdmahaseth@lagrange.edu]
Sent: Monday, November 29, 2010 2:23 PM
To: Pfeiffer, Eric
Subject: Requesting permission to use the SPMSQ

Dr. Pfeiffer,

Hello, I am currently a nursing student with LaGrange College located in LaGrange, Georgia. I am conducting a basic nursing research project and would like to use the Short Portable Mental Status Questionnaire (SPMSQ). The reason we’re requesting the use of your tool is to cognitively screen participants before allowing them to partake in our research study in the dialysis unit. Would you allow us (Lona Mahaseth, Lauren Horton and Jessie Brown) permission to use this tool?

Sincerely,

Lona Mahaseth
REQUEST FOR RECORD RETRIEVAL
FOR SCIENTIFIC STUDY

Requesting Physician / Individual: Lona M. Mahaseth, Lauren Norton, and Jessie Brown

Requesting Institution: LaGrange College of Nursing

Purpose of Study: The purpose of this study is to determine if relaxation music decreases sensory pain by measuring blood pressure, pulse, and respiration in kidney failure patients who are undergoing dialysis treatment. We hope to learn if music therapy can be an effective nursing intervention.

Do you intend to publish the results of this study? 

X Yes

No

Requesting Physician / Individual: Lona M. Mahaseth

Performance Improvement Committee: [Signature]

Date: 12/2/2010

Date: 12/15/2010

Revised: 12/03/2011