THE EFFECT OF GUIDED RELAXATION ON ANXIETY AND PAIN INTENSITY IN
PATIENTS WITH TOTAL KNEE REPLACEMENT

by

Taylor R. Akins BSN, RN

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DNP Project Approval Form

This is to certify that

Taylor Akins

(Name of Student)

successfully defended their project entitled:

Guided Relaxation for Pain Management

on April 12, 2019.

(Date)

DNP Project Advisor

Yu-Ping Chang PhD, RN, FGSA, FAAN

(Typed Name)

(Signature)

(Required)

Committee Member 1*

(Typed Name)

(Signature)

Committee Member 2*

(Typed Name)

(Signature)

Committee Member 3*

(Typed Name)

(Signature)

*If applicable
Abstract

**Purpose:** The purpose of this project is to determine if guided relaxation affects pain intensity and anxiety rating in patients undergoing total knee replacement.

**Background:** Approximately 80% of patients with post-operative pain do not receive adequate pain management. Opioids are the mainstays of treatment for acute pain. Many of these surgical patients have prolonged opioid use that has led to the development of chronic pain. A promising approach to manage pain is the use of non-pharmacologic modalities such as guided relaxation.

**Theoretical Framework:** Kolcaba’s Comfort Theory was used to guide this study.

**Methods:** Randomized control trial with 2 groups; the intervention group, and the control group. The intervention group listens to the guided relaxation tape daily, while the control group receives normal care. Data analysis included independent t-tests to assess for baseline differences, and paired t-tests to compare the two groups pre and post intervention. A p-value of <0.05 was statistically significant.

**Results:** The paired t-test showed that anxiety and pain decreased in the intervention group. The results were statistically significant with anxiety (p = .014) and pain intensity (p = .029). The control group did not show significant decreases in pain (p = .93) or anxiety (p = .14).

**Conclusion:** Promising preliminary results show that guided relaxation techniques can help decrease both pain intensity and anxiety rating in knee replacement patients post-operatively.

**Keywords:** non-pharmacologic, guided relaxation, pain management, anxiety, post-operatively
Acknowledgments

I would like to express my sincere gratitude to my advisor Dr. Yu-Ping Chang. Your guidance throughout this process is something I cannot thank you enough for. I am now more confident to be able to do research on my own in the future.

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Lastly, I would like to thank my fiancé Noah who has kept me grounded and supported me through the ups and downs of school. Your understanding, support, and insight helped me every step of the way.
Introduction

The amount of surgical procedures being performed annually is steadily increasing (“Surgery 2015-2017”, 2017). It was reported that 51.4 million inpatient surgical procedures were performed in 2010 (“Surgery 2015-2017”, 2017). Acute pain after surgery is often an area of anxiety and worry for patients. It has been reported that over 80% of patients pain post-operatively is not adequately controlled (Tong, 2017). Sub-optimal pain control following surgery can lead to significant problems including increased morbidity, impaired physical function, impaired pulmonary function, anxiety, ileus, and thromboembolism (Baratta, Schwenk & Viscusi, 2014; Gan, 2017; Lin, Reid, Liu, Chused & Evans, 2015). This results in increased costs from increased length of stay along with a decrease in patient satisfaction and quality of life (Lin et al., 2015). Opioids are the mainstays of treatment for acute pain and greater than half of inpatients receive opioid therapy during their hospital stay (Garland et al., 2017). Many of these patients have prolonged opioid use not only during the hospital stay but also after which in turn has lead to the development of chronic pain (Gan, 2017). The use of combined pharmacological and non-pharmacologic techniques need to be utilized together to help control pain in the post-operative setting. Non-pharmacologic techniques like relaxation could help patients reduce the intensity of pain and anxiety follow surgery (Rejeh, Heravi-Karimooi, Vaismoradi & Jasper, 2013).

PICO Question

Does the use of guided relaxation lead to better pain management outcomes in patients with total knee replacement surgery in the acute post-operative setting compared to patients who received usual care?
Project Objectives

This study's purpose is to determine if the use of guided relaxation influences pain control in the acute post-operative setting. The objectives are:

I: To determine if there is a difference in pain intensity following guided relaxation using the Visual Analog Scale (VAS)

II: To determine if there is a difference in anxiety levels using the Generalized Anxiety (GAD-7)

III: To identify if there is a change in physical functioning during mandatory physical therapy as recorded in the physical therapy clinical note along with heart rate, blood pressure, and opioid use from the electronic medical record (EMR)

Literature Search Strategy

The purpose of this scholarly project is to determine if guided relaxation affects pain intensity and anxiety rating in patients undergoing total knee replacement. The ultimate goal is to hopefully introduce this into nursing practice at the city hospital. This study is going to take place at. In this section, the themes of the literature review will be examined. These include pain management, nonpharmacologic pain management, guided relaxation, and anxiety and pain intensity.

A literature review was undertaken to look at how relaxation techniques were used in the post-operative setting. Databases included CINHAL, PubMed, and Medline. Search items used include relaxation techniques, guided relaxation, post-operative, non-pharmacologic pain management, surgery, pain management, and anxiety. The focus was relaxation and articles were phased through to find relaxation as the main intervention used. The literature review contained
articles from 2000-2018. Inclusion criteria were surgical patients, relaxation, and pain intensity. Studies were excluded if they did not include surgical patients in the post-operative setting.

**Literature Review**

The purpose of this project is to determine if guided relaxation influences pain intensity and anxiety rating among postoperative surgical patients. In this section the literature review supports the connection between pain management and guided relaxation provides improvements in reported pain intensity and anxiety ratings. There is a vast amount of research in pain management and treatment options for patients yet pain is still poorly controlled in surgery patients (Tong, 2017). Nonpharmacologic techniques should be added to pharmacologic interventions to decrease pain intensity. Guided relaxation is a guide though conscious awareness by refocusing attention on something calming. When people are in pain muscles tense up which in turn creates more pain and makes pain worse. Relaxation can help break this cycle. Literature has shown that with increased pain often comes increased anxiety and relaxation has shown to help combat both (Baratta, Schwenk & Viscusi, 2014; Gan, 2017; Lin, Reid, Liu, Chused & Evans, 2015).

**Pain management**

Currently there is a pain management crisis in the country and the rising cost of pain management and adverse effects have prompted national attention and a push for change (Tick et al., 2018). Millions of Americans are diagnosed with acute pain that resolve over days to weeks (Bonnie, Ford & Phillips, 2017). Opioids are the most commonly prescribed medication to treat these conditions (Bonnie et al., 2017). Evidence is still lacking regarding the advancement of acute to chronic pain. Although, evidence has pointed to adequately treated acute persistent
postsurgical pain could decrease the likelihood of future development of chronic pain (Bonnie et al., 2017).

The last decade is when the fifth vital sign was introduced and there was a huge push on practitioners to address pain and “eliminate” patient’s pain (Bonnie et al., 2017). Often times reimbursement and other incentives are tied to hospital surveys and pain management has been on the majority of them in the past decade. In 2016 the Centers for Medicare & Medicaid Services issued a proposal to take pain management off hospital surveys to reduce overuse of opioid prescriptions from providers (Bonnie et al., 2017).

The term pain management has different meanings. It is often times thought of as using solely pharmacologic modalities for acute pain (Tick, et al., 2018). The truth is pain management can involve various different tools and techniques including pharmacologic and nonpharmacologic techniques (Tick et al., 2018). Using strategies from different disciplines like cognitive-behavioral strategies along with pharmacologic treatment have shown the best treatment for all types of pain (Tick et al., 2018).

**Nonpharmacologic approaches for acute pain management**

There is a drive for pain management to shift away from opioids and move towards evidence-based nonpharmacologic options (Tick et al., 2017). Some examples of nonpharmacologic pain options are heat, ice, massage, acupuncture, music, guided imagery, and relation/meditation. These interventions can be used by anyone and advance practice nurses along with registered nurses need to be educated on these techniques.

It is strongly recommended that nonpharmacologic therapies along with around the clock non-opioid analgesics be used as a first line treatment in the postoperative setting (Correll, Golembiewski & Pizzi, 2018). The American Pain Society (APS) recommends cognitive
modalities as a nonpharmacologic strategy in conjunction with a local anesthetic or intrathecal opioid for total knee replacement surgery (Correll et al., 2018). Nonpharmacologic strategies are beneficial because these individuals can continue using them at home and in their future (Correll et al., 2018). This is where education on the provider’s part comes in to teach patients all the benefits of these techniques.

Studies show that patients who were given nonpharmacologic modalities ended up using less opioids and had less anxiety than the control group (Pellino et al., 2005). There are proven benefits in the literature but often times nonpharmacologic techniques are not utilized (Lin, 2012). A major reason is the lack of knowledge and education on certain interventions in both the practitioners and patients (Lin, 2012). If a practitioner does not understand possible interventions how can it be taught or discussed with patients. Other barriers include time and lack of interest from patient or provider (Lin, 2012).

**Guided Relaxation**

Relaxation is a nonpharmacologic technique that is easy to use and should be used in the postoperative setting to combat pain and anxiety. A study by Heye, Foster, Bartlett & Adkins (2002) showed that a focus on breathing and muscle relaxation revealed a decrease in anxiety because of a decrease in the pain messages that are sent to the spinal cord. The majority of studies that use relaxation techniques for acute pain utilize pre-recorded tapes some with headphones to deliver the intervention (Good, Anderson, Stanton-Hicks, Grass & Makii, 2002; Lim, Yobas, & Chen, 2014; Lin, 2012; Rejeh, Heravi-Karimoi, & Jasper, 2013; Roykulcharoen & Good, 2004). Experts in the field for the study create the tapes or a tape was reused from previous work. Generally the intervention is done multiple times throughout the postoperative period with the majority repeating the intervention 3 times throughout a hospital stay (Good,
Anderson, Ahn, Cong & Atanton-Hicks, 2005; Good et al., 2002; Lim et al., 2014; Lin, 2012; Rejeh et al., 2013). There have been three studies that only used a single session of a relaxation technique in the post-operative period, all which showed positive results (Garland et al., 2017; Roykulcharoen & Good, 2004; Sharpe, Nicholson Perry, Rogers, Refshauge & Nicholas, 2013). There is a high level of heterogeneity for the primary focus of relaxation in the current literature. Many studies used breathing techniques as the main part of their study (Garland et al., 2017; Good et al., 2002; Lim et al., 2014; Lin, 2012). Others focused on jaw relaxation, relaxation of specific muscle groups, and guided imagery (Rejeh et al., 2013; Seers et al., 2008; Sharpe et al., 2013). Interventions lasted anywhere from 10 minutes to 60 minutes. Some studies did pre-operative teaching and then the intervention multiple times after surgery (Lin, 2012; Good et al., 2002; Sharpe et al., 2013). Others opted to not do pre-operative teaching and just do the intervention in the post-operative period (Garland et al., 2017; Lim et al., 2014; Rejeh et al., 2013; Seers et al., 2008). The one common theme between those mentioned previously is that all had an effect on decreasing pain intensity ratings (Garland et al., 2017; Good et al., 2002; Lim et al., 2014; Lin, 2012, Rejeh et al., 2013; Seers et al., 2008).

Relaxation techniques can be used in multiple ways and given at multiple times in the recovery process. The literature shows that relaxation techniques help to decrease pain and anxiety while also decreasing the amount of opioids that are requested and administered (Garland et al., 2017; Good et al., 2005; Good et al., 2002; Pellino et al., 2005; Rejeh et al., 2013).

**Pain Intensity**

Postoperative pain is experienced by almost all of individuals who undergo surgery. Sub-optimal pain control following surgery can lead to significant problems including increased
morbidity, impaired physical function, impaired pulmonary function, anxiety, ileus, and thromboembolism (Baratta, Schwenk & Viscusi, 2014; Gan, 2017; Lin, Reid, Liu, Chused & Evans, 2015). This results in increased costs from increased length of stay along with a decrease in patient satisfaction and quality of life (Lin et al., 2015).

Pain assessment is a part of nursing responsibility. They are to assess pain provide an intervention and reassess pain as part of their nursing care plan. Pain is assessed in a multitude of ways. For the purpose of this study we will talk about the visual analog scale (VAS). This tool is a scale that uses facial features to rate pain intensity.

Multiple studies showed a decrease in pain intensity between the experimental and control group (Garland et al., 2017; Good et al., 2002; Lim et al., 2014 Lin, 2012; Rejeh et al., Pellino et al., 2005; Rejeh et al., 2013). Two similar studies using only a single relaxation intervention showed that there was a decrease in pain intensity reporting after the intervention (Garland et al., 2017; Sharpe et al., 2013). Multiple published research states that there is an obvious decrease in pain management when using relaxation techniques and researchers conclude that it needs to become a part of post-operative care to help manage pain (Garland et al. 2017; Good et al., 2002; Lim et al., 2014; Lin, 2012; Rejeh et al., 2013, Seers et al., 2008).

**Anxiety**

Individuals who undergo surgery often experience preoperative and postoperative anxiety (Erçi, Sexgin, & Kacmaz, 2008). High anxiety has led to a decrease in patient satisfaction along with a decreased patient recovery (Erçi et al., 2008). Anxiety can present in multiple psychological symptoms that can be present in the postoperative period (Erçi et al., 2008). One indicator for anxiety in the preoperative period is postoperative pain (Erçi et al., 2008).
A common outcome measure in the literature among pain management is anxiety rating. There are multiple validated tools that have been used to measure anxiety level. In this study the GAD-7 will be used. This is a 7-question questionnaire that the patient fills out in which anxiety level is rated. Multiple studies showed that there was a significant reduction in anxiety level rating in the experimental group vs. the control group (Garland et al., 2017; Lim et al., 2014; Lin, 2012; Rejeh et al., 2013). Two studies showed that there was not statistical difference in anxiety between the control and experimental group (Roykulcharoen et al., 2004; Seers et al., 2008). They state that each had anxiety that decreased no matter what intervention was used (Garland et al., 2017; Lim et al., 2014; Lin, 2012; Rejeh et al., 2013, Roykulcharoen et al., 2004; Seers et al., 2008). Anxiety is not always used as an outcome variable in the literature but will be assessed in this study.

**Theoretical Framework**

The theoretical framework that will be used in this project is Kolcaba’s comfort theory. This theory provides a framework for acting out comforting care in nursing (Fitzpatrick & Kazer, 2011). Comforting care is described as goal directed actions where patient/family comfort is achieved (Fitzpatrick & Kazer, 2011). The process starts with assessing comfort before and after an intervention and the understanding that the process is not complete until comfort has been accomplished (Fitzpatrick & Kazer, 2011). The nursing definition of comfort goes above and beyond the day-to-day and technical skills of nursing using a holistic approach (Fitzpatrick & Kazer, 2011).

Kolcaba introduced three forms of comfort: relief, ease, and transcendence that are addressed in the contexts of physical, psychospiritual, sociocultural, and environmental (Fitzpatrick & Kazer, 2011). This project addresses all of these in management of pain in the
postoperative period. For instance, guided relaxation in this study is hopefully going to show relief of pain. Also, relaxation has been shown to promote calmness and contentment when pain is addressed after surgery. The goal of this project is to reach transcendence where they understand their level of pain and comfort and realize that they can rise above the pain and achieve what they need to achieve health again.

Comfort theory guides nursing researchers to enquire about relationships between different holistic interventions and comfort (Fitzpatrick & Kazer, 2011). This is where this current project comes in, we want to understand if guided relaxation decreases pain intensity rating. There has been comfort studies done that has shown significant differences between treatment and usual care on comfort (Fitzpatrick & Kazer, 2011). The goal is that this project will encourage policy makers in this big city hospital to implement this technique in nursing care plans in the postoperative setting. Relationships that have been tested have been positive and comfort was found to be a positive indicator for those who do well in therapy (Fitzpatrick & Kazer, 2011). This comfort theory states that these institutions would have better health care outcomes like lower costs, and readmission rates (Fitzpatrick & Kazer, 2011). This ties in perfectly with my project and shows why it needs to be undertaken.

Design

This capstone project will be a randomized control trial with 2 groups, the intervention group and the control group. This study will be conducted at a large 457-bed local teaching hospital in Buffalo, NY. The primary outcomes of this study are to decrease pain intensity and anxiety ratings in post-operative knee replacement patients.
Sample and Setting

The targeted population in this study is patients who undergo knee replacement surgery. Recruitment strategies involved meeting these patients when they come in for their pre-operative surgical meeting. Subjects will be randomly assigned. The inclusion criteria are subjects must be 18 or older, undergoing a total knee replacement, are able to read and communicate the English language, and placed on the surgical floor post-operatively. The exclusion criteria is if a participant is less than 18 years old, is not placed on the orthopedic surgical floor post-operatively, not able to read/speak English, and if they have any other surgery that day besides the total knee replacement.

The sample size will be based on a power at 0.8, a medium effect size and alpha at 0.05. The sample size needed for this study is 68, 34 for the control group and 34 for the experimental group.

Data Collection Procedure

Upon approval from the Institutional Review Board at the University at Buffalo the researcher will contact the teaching nurse on the orthopedic floor to see when pre-operative meetings are set up for. The researcher will be introduced by the nurse to the participants to gauge interest. If the patient shows interest informed written consent will be obtained there.

Measures

Two instruments will be used to measure outcome variables including the VAS for pain intensity ratings, and the GAD-7 to measure anxiety.

The GAD-7 will be given at multiple different times throughout their hospital stay. The first time it will be administered is before surgery in their preoperative meeting. The second time it will be administered is after surgery before the intervention and then again after the
intervention daily for the duration of their hospital stay. The current literature demonstrates the high validity and reliability of the GAD-7 (Lowe et al., 2008). One compared self reported scale diagnosis and independent diagnosis made my mental health professions. It reported that the GAD-7 has good reliability, criterion, construct, factorial, and procedural validity (Spitzer, Kroenke, Willaims, Lowe, 2006). Another study used GAD-7 along with other scales and found internal consistency and intercorrelations was identical with other scales (Lowe et al., 2008).

Robert Spitzer, MD, originated this tool and it is a 7-question questionnaire that measures anxiety rating (Spitzer, Kroenke, Williams & Lowe, 2006). The reliability was excellent for this tool (Cronbch a= .92) and the validity was good (interclass coorelation- 0.83) (Spitzer, Kroenke, Williams & Lowe, 2006). This supports reliability and validity of the GAD-7 in measurement of anxiety in the general public.

The VAS will be administered at the preoperative meeting, after surgery but before the intervention, after the intervention, and daily for their whole hospital stay. The VAS originated from the continuous analog scale in the field of psychology to measure well being (Visual analog scale, 2017). The reliability is good (r= 0.94 p=0.001) and validity was strong (r= 0.72, confidence interval, 0.57-0.82) (Hielm-Björkman, Kapatkin, & Rita, 2011). This scale has pictures of faces that will be used to rate pain intensity. Hawker, Mian, Kendzerska, & French, 2011 state that its simplicity, reliability, and validity make it the best tool to use to assess pain intensity. Another study verified the construct validity of the VAS in the immediate postoperative setting (Bodian, Freedman, Hosain, Eisenkraft, & Beilin., 2001). The reliability of VAS as a measure of pain sensation experiencing mild to moderate pain has been demonstrated in the postoperative setting (Bodian et al., 2001). The VAS is one of the most common scale used to rate pain intensity post-operatively (Hielm-Björkman, Kapatkin, & Rita, 2011).
Furthermore, we will include heart rates, blood pressure, opioid dosage, and physical functioning as outcome variables. We will retrieve information regarding heart rates, blood pressure, and opioid dosage from the electronic medical record.

**Intervention Process**

The guided relaxation tool we will be using is a pre-recorded voice recorded relaxation tape. Experts in the field will be recruited to assist in creating the guided relaxation tape. We will take the expert in the fields opinion along with adopting parts from previously recorded guided relaxation tapes. The tapes will be played at the patient’s convenience. A laminated sign will hang on the door “STOP; please do not disturb, relaxation intervention in progress” to achieve total relaxation.

**Demographics**

Demographic characteristics will be collected including sex, age, educational level, previous surgical history. The dependent variable is pain intensity, and anxiety rating, blood pressure, heart rate, opioid use, and physical functioning. The independent variable is guided mediation.

**Statistical Analysis**

The software that will be used for statistical analysis will be the latest version of SPSS. We will set the p-value at 0.05 for this study. Independent t-tests will be run to determine if there are significant difference in baseline assessment between the two groups. ANCOVA will be used to control for baseline differences if any exist. An example would be poor pain level or bad anxiety before surgery. Although this is a randomized control trial if baseline differences exist we will use ANCOVA to control for the differences.
**Ethical Considerations**

In order to protect the identities, welfare, and rights of all patients in this study, approval for the research were submitted to the International Review Board (IRB) before the study was undergone. Approval from University at Buffalo IRB was granted prior to data collection (IRB ID Number STUDY 00002920). All policies by the IRB were followed and met to protect patient information.

**Results**

A total of 35 patients were included in this study; 21 in the intervention group (patients who listened to guided relaxation tape), and 21 in the control group (who received normal care). The sample consisted of 32% males and 38% females with an average age of 68.4 (SD= 9.8). The sample was primarily Caucasian (n= 33, 66%), the other 4% were American Indian. The demographic characteristics for the study participants were summarized in Table 1. This study compared the intervention and control group and looked at baseline differences in the two groups. An independent sample t-test was done first to assess if any baseline differences existed. The results are shown below (Table 2 and 3).

This t-test was used to examine difference in the GAD and pain scale between two groups before any intervention was given. Results showed that the intervention group had a higher level of anxiety than the control while the control had a higher level of pain than the intervention group. However, those differences do not reach statistical significance (p=.77 for GAD; p=.10 for Pain).

The t-test was repeated to look at differences between the two groups post-intervention on the first day. Results showed that participants in the intervention group reported a lower level of pain intensity after the intervention compared to those in the control group (p=.04). The
difference in anxiety score between groups after the intervention was not statistically significant (p = .53). Because there were no significant baseline differences between the two groups paired t-tests were used. If there were baseline differences, we would have used ANCOVA to control for them.

A paired t-test was used to compare pre and post intervention in the intervention group (those who received the guided relaxation tape) as well as the control group. The results showed that both pain and anxiety rating decreased significantly in the intervention group (p = 0.014 for anxiety and .029 for pain. (Table 4 and 5).

Paired t-test was used again to compare pre and post intervention in the control group (those who received usual care). The results showed that reported anxiety (p = .14) and pain (p = .93) were not statistically significant.

Discussion

This study determined the effectiveness of guided relaxation on pain intensity and anxiety rating in patients undergoing total knee replacement surgery. We hypothesized that the intervention group that listened to the guided relaxation tapes would decrease pain intensity rating and anxiety in the post-operative period. This hypothesis was supported through our analysis.

In this study pain intensity decreased in the intervention group as compared to the control group post-intervention. This may indicate that guided relaxation tapes can be effective in decreasing pain in the post-operative period, which parallels other studies (Garland et al., 2017; Good et al., 2002; Lim et al., 2014 Lin, 2012; Pellino et al., 2005; Rejeh et al., 2013). Lin (2012) showed that the experimental groups pain intensity rating decreased significantly after a brief relaxation intervention in joint replacement surgery patients. Rejeh et al.’s study showed that the
experimental group who listened to a brief relaxation tape experienced less pain in comparison with the control group after the intervention in abdominal surgery patients. This decrease in pain could be attributed to the addition of pain medications and whether they were given or not, this information would have been beneficial if we knew what exact time the participants in the intervention group listened to the tape in comparison to the administration of pain medications.

Anxiety rating was about the same in each group and did not decrease significantly after the intervention. The control group by default had a lower level of anxiety and did a little bit better than the intervention group but it was not statistically significant. A possibility to this could be the control group tended to stay a shorter period of time than the intervention. This contradicts similar studies (Lim et al., 2014 Lin, 2012; Rejeh et al.) These studies found that a brief relaxation technique decreased anxiety in the post-operative period and results were statistically significant (Lim et al., 2014 Lin, 2012; Rejeh et al.) A possibility as to why this study differend with those mentioned could be the fact that many of our participants only listened to the relaxation tapes once. If they had listened to it multiple times with more consecutive days, results may have been different. Patients in this study were being discharged quicker than expected so the longitudinal change of these patients’ anxiety scores was not collected. Seers et al. (2008) found that there was no difference in anxiety between groups using brief relaxation techniques for anxiety in orthopedic patients, which was similar to our findings.

Comparing each individual group to themselves showed that there was a decrease in both pain and anxiety in the intervention group. This supports the hypothesis and shows that a brief relaxation could be beneficial in decreasing pain in the post-operative setting. Multiple published research states that there is an obvious decrease in pain management when using relaxation techniques and researchers conclude that it needs to become a part of post-operative care to help
manage pain (Garland et al. 2017; Good et al., 2002; Lim et al., 2014; Lin, 2012; Rejeh et al., 2013, Seers et al., 2008). This is an easy technique that can be done without the need for teaching for nurses and practitioners.

Pain intensity and anxiety rating did not significantly improve in the control group. This is similar to previous studies (Lim et al., 2014 Lin, 2012; Rejeh et al., 2013). Each of the studies mentioned showed no significant improvement or change in pain and anxiety rating between the control and intervention groups. A relaxation technique is an easy adjunct to pharmaceutical pain management and this needs to become a part of regular care especially in the post-operative setting.

**Strengths**

Design strengths were randomization. It was totally random who was in the control and the intervention groups. The project design includes strategies for practitioner, nurse, etc. to be able to deliver and educate participants on guided relaxation to improve pain management in the post-operative setting. This technique could be something that is used by these participants for years to come.

**Limitations**

A limitation of this study is the small sample size. It would be beneficial if there were more people in the study over a longer period of time. This was also only done in one specific population in one single hospital and floor. More information could be obtained if a larger study with multiple different hospitals and units was done. The data is self-reported. There is a possibility for bias in the participant's responses. Time when the intervention was done was not measured, if we had this information we could look at heart rate and vital signs to see if the intervention improved heart rate that often is elevated when someone is in pain. Lastly, we are
unsure how many times people listed to the tape or for how long. It could be one, twice, or multiple times. These are all things that I would change and measure in a future study.

**Conclusion**

Promising preliminary results in the study showed that guided relaxation techniques can help with decreasing both pain intensity and anxiety levels in knee replacement patients post-operatively. CD tape delivered guided relaxation tapes is a simple and cost-effective tool in treatment of pain and anxiety in postoperative patients. APRN’s can easily incorporate this type of intervention in their practice to reduce pain intensity and anxiety in patients who receive total knee replacement surgery.
References


Hawker, G. A., Mian, S., Kendzerska, T., & French, M. (2011). Measures of adult pain: Visual analog scale for pain (VAS pain), numeric rating scale for pain (NRS pain), McGill pain questionnaire (MPQ), Short-Form McGill pain questionnaire (SF-MPQ), chronic pain grade scale (CPGS), short Form-36 bodily pain scale (SF-36 BPS), and measure of intermittent and constant osteoarthritis pain (ICOAP). *Arthritis Care & Research, 63(S11)*, S240-S252. doi:10.1002/acr.20543


allergy and clinical immunology (DGAKI), ENT section, in collaboration with the
working group on clinical immunology, allergology and environmental medicine of the
german society of otorhinolaryngology, head and neck surgery (DGHNOKHC). *Allergy
Journal International*, 26(1), 16.

efficacy, and stress-related variables in patients following total knee replacement surgery.

Lin, P. (2012). An evaluation of the effectiveness of relaxation therapy for patients receiving

quality inpatient pain management: A qualitative study. *American Journal of Hospice
and Palliative Medicine*, 32(6), 594-599. doi:10.1177/104990114530491
doi:10.1111/j.1365-2702.2010.03406.x

Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y.
(2008). Validation and standardization of the generalized anxiety disorder screener
(GAD-7) in the general population. *Medical Care*, 46(3), 266-274.
doi:10.1097/MLR.0b013e318160d093

total hip and total knee arthroplasty. *Orthopaedic Nursing / National Association of


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January 23, 2019

Dear Taylor Akins:

On 1/23/2019, the IRB reviewed the following submission:

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<tr>
<td>Title of Study:</td>
<td>The Effect of Guided Relaxation on Acute Pain</td>
</tr>
<tr>
<td>Investigator:</td>
<td>Taylor Akins</td>
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<tr>
<td>IRB ID:</td>
<td>MOD00005338</td>
</tr>
<tr>
<td>Funding:</td>
<td>None</td>
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<tr>
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</tr>
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<td>IND, IDE, or HDE:</td>
<td>None</td>
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<td>Documents Reviewed:</td>
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<tr>
<td>Personnel Changes:</td>
<td>Added: Lisa Wawrzynek</td>
</tr>
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The IRB approved the study from 1/23/2019 to 12/6/2019 inclusive. Before 12/6/2019 or within 30 days of study closure, whichever is earlier, you are to submit a continuing review with required explanations. You can submit a continuing review by navigating to the active study and clicking Create Modification / CR.

As principal investigator for this study involving human participants, you have responsibilities to the SUNY University at Buffalo IRB (UBIRB) as follows:

1. Ensuring that no subjects are enrolled prior to the IRB approval date.
2. Ensuring that the study is not conducted beyond the expiration date without re-approval by the UBIRB.
3. Ensuring that the UBIRB is notified of:
   - All reportable information in accordance with the New Information SOP (HRP-024).
   - Project closure/completion by submitting a Continuing Review/Modification submission.
4. Ensuring that the protocol is followed as approved by UBIRB unless a protocol amendment is prospectively approved.
University at Buffalo Institutional Review Board (UBIRB)
Office of Research Compliance | Clinical and Translational Research Center Room 5018
875 Ellicott St. | Buffalo, NY 14203
UB Federalwide Assurance ID#: FWA00008824

5. Ensuring that changes in research procedures, recruitment or consent processes are not initiated without prior UBIRB review and approval, except where necessary to eliminate apparent immediate hazards to subjects.

6. Ensuring that the study is conducted in compliance with all UBIRB decisions, conditions, and requirements.

7. Bearing responsibility for all actions of the staff and sub-investigators with regard to the protocol.

8. Bearing responsibility for securing any other required approvals before research begins.

If you have any questions, please contact the UBIRB at 716-888-4888 or ubirb@buffalo.edu. Please include the project title and number in all correspondence with the UBIRB.
The Effect of Guided Relaxation on Anxiety and Pain Intensity in Patients with Total Knee Replacement
Taylor Akins - DNP Student
Mentor: Yu-Ping Chang, PhD, RN, FGSA, FAAN, School of Nursing, University at Buffalo, The State University of New York

Introduction
- Acute pain post-operatively is often an aspect of anxiety and worry for patients
- Over 80% of post-operative pain is not adequately controlled
- Opioids are the mainstays of treatment for acute pain
- More than half of patients receive opioids during their hospital stay
- Many of these surgical patients have prolonged opioid use that has led to the development of chronic pain
- One of evidence-based interventions to manage pain is the use of nonpharmacologic modalities such as guided relaxation.

Purpose
The purpose of this study is to determine if guided relaxation affects pain intensity and anxiety rating in patients undergoing total knee replacement.

Theoretical Framework
Kokasoa’s Comfort Theory was used to guide this study. Kokasoa introduced three forms of comfort: relief, ease, and transcendence that are addressed in the contexts of physical, psychosocial, sociocultural, and environmental
This project addresses all of these in management of pain in the postoperative period.

Methods
Design: Randomized control trial with 2 groups: intervention and control group
Recruitment: Pre-operative classes on the orthopedic floor in a 403-bed local teaching hospital in Buffalo, NY.

Results

Table 1 Demographic Analysis

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>16</td>
<td>0.0</td>
</tr>
<tr>
<td>Female</td>
<td>19</td>
<td>3.0</td>
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Table 2 Baseline Difference Between Two Groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>DM</th>
<th>SD</th>
<th>Sig. (2-tailed)</th>
<th>95% CI</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>1.36</td>
<td>0.0</td>
<td>0.00</td>
<td>1.67</td>
<td>2.09</td>
<td>2.30</td>
</tr>
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</table>

Table 3 Post-Intervention Difference Between Two Groups

<table>
<thead>
<tr>
<th>Measure</th>
<th>DM</th>
<th>SD</th>
<th>Sig. (2-tailed)</th>
<th>95% CI</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>1.75</td>
<td>0.0</td>
<td>0.00</td>
<td>2.17</td>
<td>3.45</td>
<td>1.11</td>
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</tbody>
</table>

Discussion
- Both pain and anxiety are statistically significant reduced in the intervention group compared to the control group.
- This project demonstrates promising preliminary results.

Limitations
- Small sample size
- Self-reported data, so there is a possibility of bias
- Data collection was limited to a specific population in one hospital

Conclusion/Implications
- Promising preliminary results show that guided relaxation techniques can help decrease both pain intensity and anxiety rating in knee replacement patients post-operatively.
- CD tape delivered guided relaxation tapes are a simple and cost-effective tool in treatment of pain and anxiety in postoperative patients.

Acknowledgements
- Special thanks to Dr. Chang for her mentorship.
- References available upon request.