



Knowledge Analysis of Pregnant Mothers About Newborn Treatment  
**(Diah Nurhidayati, Tuti Yanuarti)**

The Relationship Between Nurse Supervision With Compliance Toward Handover During The Pandemic COVID-19 in Indonesia  
**(Dudi Mauludin, Lia Idealistiana)**

The Effect of Father's Education on Increasing Knowledge, Attitudes, and Practice of Health Protocols in Preventing COVID-19 in Nursing Students  
**(Sarma Eko Natalia Sinaga)**

Behavior Prevention Modification of Non-Communicable Diseases During the COVID-19 Pandemic Using Android-Based Telenursing Application "SI-TELUR PETIS"  
**(Mei Rianita Elfrida Sinaga, Indrayanti, Muhammad Irfan)**

The Effect of Touch Less Spiritual Therapy and Yin Yoga Toward Student's Perceived Stress During Covid-19 Pandemic  
**(Oda Debora, Sulistyono)**

Mix Method Impact of Exposure of Inhalants Exposure "Glueing" on Street Children Community in Kendari City  
**(Asbath Said, Mikawati, Wa Ode Rahmadania, Sartini Risky)**

Experiences of Aggressive Behavior Patient after Physical Restraint in Mental Hospital, A Qualitative Study  
**(Iyus Yosep, Ati Surya Mediawati, Ai Mardhiyah)**

The Relationship of Brith Ball Therapy on Primigravida Mothers With A Fair Delivery Process  
**(Novianti, Feva Tridiyawati)**

The Effect of Three Good Things Technique on Self-Leadership to Nursing Students  
**(Diwa Agus Sudrajat, Andalis Munawaroh Aisyah, Suci Noor Hayati, Tria Firza Kumala)**

The Effectiveness of Soaking the Feet in Salt Water to Reduce the Degree of Edema in Pregnant Women Trimester III  
**(Arlinda Patola, Feva Tridiyawati)**

The Effectiveness of Fingerhold Relaxation Techniques and Lemon Aromatherapy Towards Reducing Pain Intensity in Post Section Caesarian Patients  
**(Fenty Ika Wardani, Elfira Sri Fitriani)**

Diabetes Distress: Assessment and Screening of Stress Levels Among People with Diabetes Mellitus  
**(Asbath Said, Mikawati, Waode Rahmadania, Ahmad Mudatsir)**

Telerehabilitation In Monitoring Treatment of Heart Disease Patients: Literature Review  
**(Wahyuni Arni, Yuliana Syam, Syahrul)**

Communication Therapy in Stroke Patients with Aphasia: A Narrative Review  
**(Sally Syamima, Urip Rahayu, Nur Oktavia Hidayati)**

Combination of Music and Guided Imagery on Relaxation Therapy to Relief Pain Scale of Post-Operative Patients  
**(Nur Hidayat, Rudi Kurniawan, Yudisa Diaz Lutfi Sandi, Esti Andarini, Fidya Anisa Firdaus, Heri Ariyanto, Reffi Nantia Khaerunnisa, Henri Setiawan)**

Telerehabilitation In Monitoring Treatment of Heart Disease Patients: Literature Review  
**(Erma Wahyu Mashfufa, Ranti Kurnia Sari, Navy Sealsi Adinda Prisca Marina, Nur Aini, Lilis Setyowati, Ollyvia Freeska Dwi Marta)**

The Effect of Tai Chi Exercise on Reduction the Risk of Falls in the Elderly: A Literature Review  
**(Novya Ashlahatul Mar'ah)**

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## Review Article

# Combination of Music and Guided Imagery on Relaxation Therapy to Relief Pain Scale of Post-Operative Patients

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### Abstract

**Aim:** This literature review aims to explain the effectiveness of combination relaxation therapies with music and imagery technique to reduce the quality and quantity of pain experienced by post-operative patients.

**Methods:** The research data were identified from 5 journal databases including PubMed, JSTOR, Willey Online Library, Sage Journal and Taylor Francis Online by using the PICO (Participant, Intervention, Outcomes and Study Design) method and Mesh term on advanced search engines. Additional records identified through Google Scholar and Research Gate. The articles that become research data are articles published in 1998–2018 in English version, open access and full-text in the form of original research articles.

**Results:** Eight articles that were screened using PRISMA reviewed without meta-analysis consisted of four articles intervening in a combination of relaxation with music and four articles combining with imagery.

**Conclusion:** The combination of relaxation techniques with music, as well as a combination of relaxation techniques with effective imagery are used to reduce pain. Based on the analysis of the results in several studies, it can be found that patient education about relaxation therapy should be given to all surgical patients to help improve patient's comfort and enhance tissue healing.

### Keywords

Guided imagery, music, pain, post operative

## INTRODUCTION

Pain is defined as an unpleasant sensory and emotional experience associated with existing or potential tissue damage or explained in terms of such damage by the International Association for the Study of Pain (1). Pain is a subjective concept that can only be defined by someone and has a

negative effect on the quality of life (2). One form of treatment that can cause pain is surgery. Many patients who undergo surgery feel post-operative pain, which is both excruciating and frustrating, but it can also lead to complications and a longer recovery period (3). The patient's response is exacerbated by the presence of pain, the presence of pain triggers increased

coagulation, fluid retention, tissue damage, and has an impact on the prolongation of the recovery process (4).

According to the research of Marion Good et al, in 2010, an estimated 50-75% of patients did not receive adequate pain relief after surgery. In adequate pain management and lack of knowledge in dealing with pain resulted in the majority of them having a less pleasant experience post-surgery, and also besides being uncomfortable and troublesome, pain can also cause complications and delayed recovery (3). Severe pain usually occurs in early post-operative experience which is often combined with anxiety about the effectiveness of surgery (5). Such experiences can have a psychological impact on patients and families, both before surgery and post-surgery (6).

Previous research found that negative emotions or inadequate pain management can affect the results of care for patients with pain problems and also affect morbidity & quality of life (7) and on the other hand lack of effective pain management has been associated with a wide range of poor outcomes. After surgery, poor pain control can lead increasing of psychological stress, weakened immune system delayed ambulation and recovery to functional capacity, and the overall expense of treatment can all be correlated with a higher risk of readmission. Alternative strategies is needed to overcome the emergence of postoperative pain. Proper pain management can reduce pain that occurs in postoperative patients.

Post Perioperative pain management is a critical component of surgical recovery (8). Advances in a

number of studies seeking to achieve optimal pain control have made pain management a major focus. Unfortunately, analgesics as a pharmaceutical therapy solely cannot often entirely avoid postoperative pain. As a consequence, interest in non-pharmacological therapies, particularly music interventions, is developing (9-11). In previous research has also shown that the development of musical interventions can be performed as a type of therapy to address post-operative pain in both of population children (9,11-14) and adults (10,16).

In addition, other pain management alternatives explain that satisfactory results in pain control through guided imagery post perioperative therapy (17-19). A general definition of guided imagery for healing could be: anything internal activity that contains thinking (uses the "mind") and has a positive effect on health. This can range from "thinking positively" to intricately organized techniques incorporating relaxation, meditation, and body postures (20). There is evidence in past research that guided imagery interventions have a beneficial effect on post-operative pain management, in addition to finding an effect on psychological factors. Relaxation therapy has been proven to provide pain relief by reducing anxiety, decreasing muscle tension and distracting attention (19). Excessive stress can increase pain as a result of working hormones in the body such as cortisol. While relaxation can increase the activity of the endorphin hormone which is very effective in relieving pain (21). There are no recent reviews of postoperative pain management. It is important for health workers to understand control strategies through

available music and guided imagery interventions to manage pain that occurs after perioperative action.

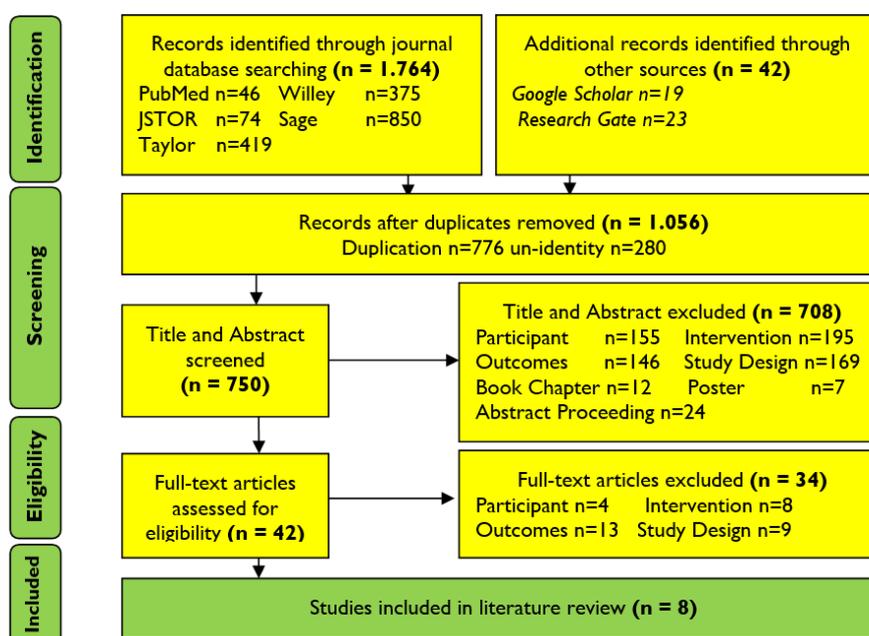
Therefore, the purpose of this review was to identify interventions for Post-Perioperative Pain Management and to consolidate data across therapy types to offer an estimate of their effectiveness and safety. Accordance clinical practice, literature reviews is an important step toward the preparation of future studies to evaluate therapies for pain management after perioperative procedures, which then providing of satisfaction and comfort, anxiety and stress reduction, morbidity and mortality reduction, and patient quality of life improvement.

## METHODS

### Search Strategy

The search strategy is carried out in several databases including; PubMed, JSTOR, Willey Online Library, Sage Journal and Taylor Franciss Online by using the Mesh System and keywords in advanced search engines;

(((((("Relaxation Therapy" [Mesh]) AND "Post-Operative" [Mesh]) OR "Post-Surgery" [Mesh]) AND "Pain Level" [Mesh]) AND "Randomized Controlled Trial" [Mesh] OR "RCT". The inclusion criteria in this literature are: articles published in 1998-2018 in English version, open access and full-text, in the form of original research articles. Participant or Population (P) in this study are post patients -operative with Intervention (I) Relaxation Therapy, Outcomes (O) in the form of pain level and Study Design (S) The study included is a Randomized Control Trial involving male and female subjects from several hospitals that have carried out intervention study operations namely reducing pain, and the study subjects were postoperative patients. The authors critically analyzed each article and took important information needed to assess the effectiveness of a combination of relaxation therapies in reducing pain scales in postoperative patients.



### *Selection of relevant studies*

After searching for articles and eliminating duplication, the title of the article was taken in a filtered basic data search. Abstraction from selected articles was further analyzed. In the second round of article searching, if there was a doubt to include a research article, it would review the article in full. Next, the authors search and select relevant studies for their review, using PIOS (Population, Intervention, Comparing, Outcome). All articles that met the inclusion criteria were analyzed using PICO and PRISMA guidelines without meta-analysis.

### *Critical judgment*

All articles were criticized and rated using CASP (Critical Appraisal Skills Programmed) by independent authors. Selected articles had good CASP levels (7-8 points) and were sufficient (5-6 points). Disagreements related to ranking scores, resolved by discussion.

### *Data extraction*

This research had conducted data extraction in the intervention and control groups, consisting of the total number of respondents, intervention guides, administrative methods, results and critical assessments.

### *Data Synthesis*

Because the review of this study included evidence studies level I, II and III, where the research steps were not homogeneous, it's not possible to analyze the data with meta-analysis. These findings were presented as a narrative summary of the study with a treatment group without treatment or 'usual care treatment'.

## RESULTS

### *Article Selection*

Articles were identified by using a search term predetermined in a combined database search conducted from 1998 to 2018, produced 1.806 articles as described in Figure 1. Three times were screened, most of the studies excluded were articles that did not meet PIOS requirements. The subjects were not postoperative patients (n = 155), did not use relaxation interventions (n = 195), did not focus on pain (n = 146) and did not use RCT (n = 169). In addition, 280 articles were excluded because they did not have an identity with 776 duplicate articles. Aside from the articles, there were 12 Book chapters, 7 posters and 24 proceeding abstracts which had been also removed from the EndNote X9 reference manager application.

### *Research characteristics*

The number of subjects from this study were 1.669 people randomly assigned with 1203 participants in interventions groups and 466 participants in control groups. The study used various combinations of relaxation techniques in postoperative patients. Results from studies in the intervention group had a positive effect in reducing pain. This literature consisted of four articles with a combination of relaxation interventions with music, and four articles with a combination of relaxation interventions with imagery. All these interventions were reported to significantly reduce pain in postoperative patients. The subjects in this study were patients from various types of operations.

**Table 1.**  
**Characteristics of The Studies**

Author, Year, Title	Method	Finding
Deborah Cupal & Briton (2001). Effects of Relaxation and Guided Imagery on Knee Strength, Reinjury Anxiety, and Pain Following Anterior Cruciate Ligament Reconstruction (23).	<b>Objective:</b> To examine the effects of relaxation and guided imagery on knee strength, reinjury anxiety, and pain for post knee surgery patients. <b>Design:</b> Randomized Controlled Trial. <b>Sample:</b> 30 participants, 20 Intervention groups and 10 control groups. <b>Intervention:</b> Combination relaxation and imagery. <b>Instrument:</b> Analyses of Covariance (ANCOVAs).	The effects of relaxation and guided imagery were able to reduce reinjury anxiety and pain in participants in the post-surgical treatment group than control groups. Mean 4.40 (SD = 1.82), $p < 0.01$ .
Kristen Nelson et al (2016). Relaxation Training and Postoperative Music Therapy for Adolescents Undergoing Spinal Fusion Surgery (10).	<b>Objective:</b> To determine the effectiveness of relaxation techniques and music in reducing the scale of pain in adolescents with spinal surgery <b>Design:</b> Randomized Controlled Trial <b>Sample:</b> 41 participants, 19 intervention groups and 22 control group. <b>Intervention:</b> Combination relaxation and music <b>Instrument:</b> Numeric Rating Scale (NRS).	Combination of relaxation techniques with music could significantly reduce pain scale with $p$ value $< 0.001$ .
Laura Vagnoli et al (2019). Relaxation - Guided Imagery Reduces Perioperative Anxiety and Pain in Children: A Randomized Study (24).	<b>Objective:</b> To investigate the effectiveness of non-pharmacological relaxation and imagery techniques, in reducing preoperative anxiety and postoperative pain in children. <b>Design:</b> Randomized Controlled Trial <b>Sample:</b> 60 participants, 30 Intervention Groups and 30 control groups. <b>Intervention:</b> The interventions given are relaxation and imagery techniques by psychologists. <b>Instrument:</b> Modified Yale Preoperative Anxiety Scale (m-YPAS).	Combination of relaxation with imagery interventions had been reported to reduce preoperative anxiety and postoperative pain in children with mean $65.5 \pm SD = 25.3$ , $p$ value $< 0.001$ .
Marion good et al (2005) Relaxation and Music Reduce Pain Following Intestinal Surgery (26).	<b>Objective:</b> To investigate the effectiveness of a combination of relaxation interventions with music in Reducing Pain in Postoperative Patients <b>Design:</b> Randomized Controlled Trial <b>Samples:</b> 167 participants, 129 intervention groups and 38 control group <b>Intervention:</b> Combination relaxation and music <b>Instruments:</b> Visual Analog Scales (VAS)	Combination of relaxation and music intervention showed that the intervention group significantly felt less pain than the control group with mean $21 \pm SD 19$ , $p=0.001$
Marion good et al (2010) Supplementing	<b>Objective:</b> To examine the effectivity of relaxation and music on postoperative	Combination of relaxation and music

Relaxation and Music for Pain After Surgery (21).	<p>pain</p> <p><b>Design:</b> Randomized Controlled Trial</p> <p><b>Samples:</b> 621 participants, 474 intervention group and 147 control group</p> <p><b>Intervention:</b> Combination relaxation and music</p> <p><b>Instruments:</b> Visual Analog Scales (VAS)</p>	could relief pain without side effects with mean $17.7 \pm SD = 20.9$ , $p < 0.001$ .
Marion Good et al (1999). Relief of postoperative pain with jaw relaxation, music and their combination (27).	<p><b>Objective:</b> To determine the combined effect of jaw relaxation and music on postoperative pain after major abdominal surgery during ambulation and rest.</p> <p><b>Design:</b> Randomized Controlled Trial</p> <p><b>Samples:</b> 617 participants, 465 intervention group and 152 control group</p> <p><b>Intervention:</b> Combination jaw relaxation and music</p> <p><b>Instrument:</b> Visual Analog Scales (VAS)</p>	Combination of relaxation with music was reported to reduce pain in the intervention group, with mean $19 \pm (SD = 20)$ , ( $p$ value = $0.022-0.000$ ).
Myra Martz et al (2004). Imagery reduces children's post-operative pain (28).	<p><b>Objective:</b> To investigate the effectiveness of relaxation and imaging, in reducing adenoidectomy pain and anxiety after ambulatory surgery (AS).</p> <p><b>Design:</b> Randomized Controlled Trial.</p> <p><b>Sample:</b> 73 participants, 36 intervention groups and 37 control groups.</p> <p><b>Intervention:</b> Combination relaxation and imagery</p> <p><b>Instrument:</b> Facial Affective Scale (FAS).</p>	Relaxation and imaging were effective in reducing pain and anxiety after adenoidectomy outpatient surgery. Mean (US) $25.97 (SD = 26.4)$ , $p < 0.01$ .
Tarja Polki et al (2008). Imagery induced relaxation in children postoperative pain relief, a randomized pilot study (29).	<p><b>Objective:</b> To test the efficacy of imaging and relaxation for pain reduction in children after intestinal surgery.</p> <p><b>Design:</b> Randomized Controlled Pilot Study.</p> <p><b>Sample:</b> 60 participants, 30 intervention groups and 30 control groups.</p> <p><b>Intervention:</b> Combination relaxation and imagery</p> <p><b>Instrument:</b> Visual Analog Scales (VAS).</p>	The effects of relaxation and imaging had proven to be effective in reducing pain in children in the postoperative bowel treatment group than in the control group. Mean $2.76 (SD = 2.43)$ , $p < 0.001$ .

### Measurement results

Pain scale in this review literature uses several instruments including:

#### 1) Visual Analog Scale (VAS)

In the article *Relaxation and Music Reducing Pain Following Intestinal Surgery* (26), the study was measured using VAS and the results showed that the combination of

relaxation with music can reduce pain reduction with significance value ( $p=0.024-0.001$ ). VAS measurements were also carried out in the article *Relief of postoperative pain with jaw relaxation, music and their combination* (27), with results that showed a pain scale experienced by the intervention

group. Similar with article *Supplementing Relaxation and Music for Pain After Surgery* (21) measurements were carried out using VAS and the results showed that the combination of relaxation and music could relieve pain without side effects with mean of  $17.7 \pm SD = 20.9$ ,  $p < 0.001$ . Furthermore, in the article *Imagery induced relaxation in children postoperative pain relief, a randomized pilot study* (29) also used a VAS measurement tool with the results of relaxation and imaging effects proven to reduce pain in children in intestine postoperative treatment group than the control group with Mean 2.76 (SD = 2.43),  $p < 0.001$ .

#### 2) NRS (Numeric Rating Scale)

In article entitled *Relaxation Training and Postoperative Music Therapy for Adolescents Undergoing Spinal Fusion Surgery* (10), this study used NRS measurement tools with the results showed that the combination of relaxation techniques with music could significantly reduce pain scales with  $p$  value  $< 0.001$ .

#### 3) Modified Yale Preoperative Anxiety Scale (m-YPAS).

The m-YPAS measurement tool was used in article entitled *Relaxation - Guided Imagery Reduces Perioperative Anxiety and Pain in Children: A Randomized Study* (24), with the result that the combination of relaxation with image intervention could reduce preoperative anxiety and postoperative pain in children with mean of  $65.5 \pm SD = 25.3$ ,  $p$  value  $< 0.001$ .

#### 4) Analyses of Covariance (ANCOVAs).

This measurement tool was used in the article *Effects of Relaxation and Guided Imagery on Knee Strength, Reinjury Anxiety, and Pain Following Anterior Cruciate Ligament Reconstruction* (23), with the results of the effects of relaxation and guided imagery could reduce reinjury anxiety and pain with Mean of 4.40 (SD = 1.82),  $p < 0.01$ .

#### 5) Facial Affective Scale (FAS).

The FAS measurement tool was used in the article entitled *Imagery reduces children's post-operative pain* (28). This study showed that relaxation and imagery result effectively reduced pain and anxiety after adenoidectomy surgery outpatients with  $p < 0.01$ .

In the study of *Relaxation and Music Reducing Pain Following Intestinal Surgery* (26). Reported that the combination of relaxation with music effectively and significantly could reduce post-operative pain. Multivariate analysis of covariance showed the significance of the influence of intervention on pain between the intervention group versus the control group. Still in the study *Supplementing Relaxation and Music for Pain After Surgery* (21), reported that the relaxation and music effects could relieve pain without any side effects. This study used multivariate analysis of covariance with contrast and pretest controls.

The study entitled *Relief of Postoperative Pain with Jaw Relaxation, Music and Their Combination* (27), explained that the combination of relaxation and music techniques was reported to reduce pain in the intervention group, significantly less pain than the control group ( $P = 0.035$ -

0.000). In an article entitled *Relaxation Training and Post-operative Music Therapy for Adolescents Undergoing Spinal Fusion Surgery* by (10), reported that the combination of relaxation techniques with music could significantly reduce pain scale.

The study entitled *Relaxation-guided Imagery Study Reduces Perioperative Anxiety and Pain in Children: a Randomized Study* (24), reported that a combination of relaxation and imagery techniques could reduce preoperative anxiety and postoperative pain among children. The results showed a significant difference between the intervention and control groups, where the results of the intervention group had less anxiety and less pain ( $p < 0.001$ ;  $p < 0.001$ ). In a study entitled *Imagery Induced Relaxation in Children Postoperative Pain Relief, a Randomized Pilot Study* (29), reported that the effects of relaxation and imaging proved effective in reducing pain in children in the post intestinal surgery group than in the control group with mean 2.76 (SD = 2.43),  $p < 0.001$ .

In the article entitled *Effects of Relaxation and Guided Imagery on Knee Strength, Reinjury Anxiety, and Pain Following Anterior Cruciate Ligament Reconstruction* (23), explained that the effects of relaxation and guided imagery could reduce reinjury anxiety and pain in participants in the post-surgical treatment group than control groups (Mean 4.40 + SD = 1.82),  $p < 0.01$ ). In the research article *Imagery Reduces Children's Post-Operative Pain* (28), reported that relaxation and imaging effectively reduced pain and anxiety after adenoidectomy surgery outpatient with Mean (AS) 25.97 (SD = 26.4),  $p < 0.01$ .

## DISCUSSION

Relaxation technique was a form of nursing care, by doing deep breathing, slow breathing (holding inspiration to the maximum) and exhaling slowly. In addition to reducing the intensity of pain, deep breathing relaxation techniques can increase lung ventilation and increase blood oxygenation (30). The basic concept of pain reduction by relaxation techniques was located in the physiology of the autonomic nervous system which was part of the peripheral nervous system, where this relaxation technique could maintain the homeostasis of the individual's internal environment (31). At the time of the release of chemical mediators such as bradykinin, prostaglandins and p substances (32,33), it would stimulate sympathetic nerves resulting in vasoconstriction and ultimately caused increasing muscle tone that caused various effects such as muscle spasms, muscle spasms caused blood vessels to be depressed, inadequate blood flow, and the rate of muscle metabolism increased (32) and the pain implants were sent from the spinal cord to the brain and were perceived as pain. At this time, deep breathing relaxation techniques could reduce the intensity of pain by relaxing the skeletal muscles that experienced the spasm (34–37).

The body was able to release endorphins and enkephalin in certain circumstances. These substances could help the pain suppressor system with analgesic effects contained therein. In this case, deep breathing relaxation techniques could relieve tension experienced by someone (38) which was able to stimulate the body to release endorphins and enkephalin so

that pain suppression systems could be formed which could reduce pain intensity (39,40).

The music therapy was a technique used to cure a disease using certain sounds or rhythms (15). Ani Farida (2011) in her research mentioned that this therapy could improve, maintain and restore mental, physical, emotional and spiritual health, but it could not be separated from how the expertise to use music or musical elements by a therapist (5,11,13,40). In the medical sciences, music therapy was referred to as a complementary therapy (Complementary Medicine). The type of music commonly used in music therapy could be adjusted to your liking, such as classical music, instrumental, and slow music (34,41,42).

Interventions using a combination of relaxation with music could effectively reduce postoperative pain. In his research, Marion Good (2005) found the combination of relaxation therapy and music, had resulted in positive patient responses including: muscle relaxation, positive emotions, sedation, and autonomic modulation. When postoperative patients were given interventions for pain, participants reported a disturbance and relaxation response meaning the client's pain was reduced and there was significant effectiveness from administering this combination therapy to postoperative patients (21,43). The combination of relaxation with music could modulate the autonomic nervous system indicators of lower cardiac and respiratory rates (15,21,26). Fun music was more effective at reducing pain and stimulating positive emotions compared to unpleasant music (26). Besides that music could also effectively improve the

quality of sleep at night in adults (27,44–47). However, in the study of Murad, et al (2016) imaging and music did not effectively reduce patient pain and anxiety during the excision procedure under local anesthesia (48).

Guided imagery was an attempt to create a pleasant impression in the mind of the client, then concentrated on the pleasant impression so that it could gradually reduce the level of pain and anxiety of the client (17,23,24,49). The pleasant process of shaping / imagining would be received by various senses afterwards, to the thalamus sensor through the brain stem. When it arrived at the cerebral cortex the stimulus would be processed into something tangible so that the brain recognized the object and the presence of the stimulus became meaningful. Pleasant shadows / imaginations became important signals and were stored well in memory (50,51). Onetime, pleasant stimuli in memory would be raised again as a perception of true sensory experience. This sensory experience could relax the mind and stretch the muscles so that it had an impact on reducing pain and anxiety felt (52).

The combination of relaxation with imagery could reduce preoperative anxiety and postoperative pain in children undergoing general anesthesia for minor surgery(17). Some of the benefits of combined image interventions that were guided by relaxation included being able to give a sense of control to the child and family, enhanced collaboration, improved recovery and improved long-term emotional and behavioral adjustment in patients, hospitalization and parents (24). Imagery or mental imagination was a technique of learning the power

of the conscious and unconscious mind to create images or situations that brought peace and silence (30).

According to previous studies relaxation therapy combined with controlled music and imagery was the most effective intervention to reduce pain and anxiety for postoperative patients. (10,48). Similar to the findings of previous research which mentioned that there were several psychological interventions that could help reduce pain such as music, suggestion, hypnosis, and relaxation techniques (6,15,53).

Based on the studies above, an illustration of the effectiveness of a combination relaxation intervention could be used as a reference in efforts to reduce pain in postoperative patients including a combination of relaxation with music and a combination of relaxation with guided imagery.

### **Study Limitation**

According to its design and approach, this study only describes the effect of a combination of relaxation intervention and guided imagery on postoperative pain. Other outcomes that affect postoperative pain such as anxiety, depression, worry, and other social burdens were not analyzed further. In addition, it is still a big question, whether this combination therapy can be performed on patients with acute and chronic pain, or only on acute pain. So, this non-pharmacological combination therapy is just to complement the pharmacological therapy.

### **CONCLUSION**

This study shows that the combination of relaxation techniques

with music, as well as a combination of relaxation techniques with effective imagery are used to reduce pain. Based on the findings of various research, it can be concluded that nurses must educate patients about relaxation treatment and that it should be administered to all surgical patients to aid in patient comfort and tissue healing

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