

Influence of Music Therapy in Post-Operative Pain

Literature Review

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<p>Abstract</p> <p>In Finland, there are many conventional methods of pain management. However, alternative options are easily undernoted or devalued. Music therapy has been relevant in many countries and has shown remarkable capabilities.</p> <p>The aim of this thesis is to find out if listening to music, and music therapy in general, has effects on pain management after a surgery. When combined with pharmacological pain management, the writers seek to find out exactly what effects, if any, music therapy has on the patient's level of pain, therefore allowing nurses to have more possibilities in treating post-operative pain.</p> <p>The method used, was a literature review. Data was searched and acquired from different sources and databases such as Cinahl. The data obtained was then broken down to form different categories and sub-categories which were then used to interpret the material.</p> <p>Research of the effects that music therapy has on post-operative pain are still being discovered every day. It is known this far, however, that music therapy in conjunction with pharmacological intervention can lead to a decrease in blood pressure, decrease in levels of anxiety as well as a decrease in levels of discomfort.</p> <p>Music therapy is cost efficient, easy to maintain and easily accessible. When combined with pharmacological pain management, it has shown to relieve anxiety with patients after operations, and in some cases have positive effect on patients' pain levels and vital functions. Other studies could contain include, the effect of music therapy and cognitive function and the effect of music therapy amongst sufferers of eating disorders, to name a few.</p>		
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1 Introduction

Pain is a normal response to surgery, and it can manifest in many ways. Post-operative pain can be difficult to manage with traditional pharmacological interventions and music can support the pain management and healing by distracting the patient and providing comfort. (Comeaux & Steele-Moses 2013.) This thesis seeks to find out through a literature review what kind of influence music therapy has on pain management in the post-operative pain management setting alongside the use of analgesics.

Music is an important part of people's lives and it is closely related to our identity and culture. It can also be a way of expressing oneself e.g. by playing an instrument or listening to music. Listening to music can make one feel excited or calmed down, depending upon the circumstances. (British Association for Music Therapy 2018.)

Music therapy has been an established medical practice since the 1950s. Music therapy means clinical use of musical interventions which are used to help a client with their emotional, mental and social needs. (American Music Therapy Association 2018.)

Since everyone can respond to music and therefore benefit from it, music therapy can be used with clients of all ages when taken into consideration their own individual needs (British Association for Music Therapy 2018). In this instance, we will focus on the effectiveness of music therapy on post-operative pain.

2 Music therapy in post-operative pain management

2.1 Definition of pain

International Association for the Studying of Pain (IASP 2017) defines pain as an unpleasant feeling caused by tissue damage or the threat of tissue damage. Pain is always considered subjective and only the person suffering from it can make a reliable assessment of the pain. Pain should not be tied together with other unpleasant feelings, such as pricking or tingling. Pain can have impact on many different aspects of life. It can affect one's mood, relationships, ability to function or work as well as subsistence. (Mitä kipu on? Perustietoa kivusta kaikille.)

Pain can be classified by several different aspects. One of them is the duration of pain, if it is acute or long-term. The cause of pain should also be determined, e.g. post-operative pain or cancer pain. The mechanism of pain should be considered, is it neuropathic pain or nociceptive pain? One important aspect to take into consideration is also the location of pain, e.g. backpain, headache. And finally, the level of pain should always be assessed. Pain can be mild pain, moderate pain or severe pain. Pain management is based on the aspects listed above and client's other diseases should be considered as well as their own individual needs and wishes. (Kipua esiintyy monenlaisissa tilanteissa 2017.)

2.2 Assessing pain

Pain assessment is always based on the client's own assessment of their pain. Client should always be interviewed and examined thoroughly, and the level of pain and the client's ability to function with the pain are reported on every meeting. The duration, type and location of pain are assessed, as well as the level of pain. Common tools used to measure the pain level can be visual analogue scale VAS, numerical rating scale NRS, verbal rating scale VRS or Wong-Bakers FACES Pain Rating Scale. When pain is measured using one tool, the measuring should be done using the same tool again. If the measuring tool is changed, the current pain level cannot be compared to

previous measurements. It is important to clarify the reason for pain, client's experience of it and other diseases or medications that affect the treatment of pain. (Kipu, Käypähoito-suositus 2017.)

The difficulties in assessing pain is a subject, that the writers of this literature review have faced multiple times during practical trainings as nursing students, as well as when working in the field of health care.

2.3 Acute and Post-operative pain

Acute pain means short-term pain that can be caused by different kinds of injuries, such as broken bone, infections and inflammations and surgeries. Usually the reason for acute pain is known and the level of pain can be lowered by treating the cause. Acute pain can be treated with analgesics which are chosen by assessing the level of pain and the client's other diseases. By treating acute pain effectively, the stress caused by tissue damage and other harmful reactions related to it can be decreased. This will promote healing and prevent the pain to become chronic. Post-operative pain is a form of pain caused by a surgical operation, and it is one form of acute pain. (Akuutti eli äkillinen kipu 2017).

The level and quality of acute post-operative pain varies depending on the extent and location of the surgery, as well as the patient's overall condition and that is why the treatment is always based on measuring the individual patient's level of pain (Kontinen & Hamunen 2015).

2.4 Pharmacological management of post-operative pain

Multimodal pain management means using medicines with different action mechanisms to decrease the amount needed for single medication. This means giving smaller amounts of various medication to reduce the risk of adverse effects big doses might cause. Multimodal analgesia can potentially provide the patient with better

pain management than monomodal analgesia. (Kontinen & Hamunen 2015, Manworren 2015.)

Opioids are usually needed in the post-operative pain management after larger operations. Adverse effects of opioids used in acute post-operative pain management include nausea, vomiting, fatigue and constipation. After smaller operations, mild opioids are usually used. (Kontinen & Hamunen 2015.)

Non-steroidal anti-inflammatory drugs (**NSAID's**) and **Paracetamol** are basic drugs used for all patients after operations unless the patient has any contra-indications for these drugs. With the use of common NSAID's the need for opioids reduces around 30-40% and with paracetamol around 20%. Contra-indications for NSAID's are e.g. kidney failure, or the possibility for it, cardio-vascular diseases, and usage of medication affecting to blood clotting. (Kontinen & Hamunen 2015.)

Corticosteroids are used in the post-operative care to prevent nausea and swelling of tissues. Their usage in pain management is limited due to adverse effects with long-term use. With single doses the adverse effects are usually minor. (Kontinen & Hamunen 2015.)

Gabapentinoids are more and more commonly used in post-operative pain management and in reducing the need for opioids. Gabapentinoids do however cause dizziness and fatigue and their role in post-operative pain management haven't been established as common practise. Misuse of gabapentinoids such as Pregabalin has increased and therefore prolonged use of gabapentinoids in post-operative pain management should be avoided. (Kontinen & Hamunen 2015.)

NMDA-receptor antagonists, especially Ketamine can be used to enhance the pain management in post-operative settings, with doses significantly smaller than ones used in anaesthesia. They are believed lower the risk for developing opioid tolerance and to even prevent the pain to become chronic. Ketamine can cause hallucinations, nightmares and vision defect. (Kontinen & Hamunen 2015.)

2.5 Music therapy and application

Music is a universal language that has the ability to move people on an emotional level. Music therapy includes playing, creating, discussing, and listening to music. Music can help bring about positive change, emotional and physical healing as well as personal growth. Music does not discriminate, anyone from any walk of life can use it (Addiction.com 2018). Music therapy uses music to help with the physical, emotional, cognitive and social needs of a patient. Music therapy improves the quality of life. Musical interventions can be used to promote wellbeing, manage stress, alleviate pain, express feelings, enhance memory and promote physical rehabilitation (Duerksen 2014).

Music therapy is an alternative or complementary tool that works in addition to drugs. It only began to be seen as a science in the middle of the Second World War, where it was used for therapeutic purposes and rehabilitation of wounded soldiers. (Barcelos, Teixeira, Ribeiro, Braga da Silva, Rodrigues, Siqueira 2018.) Music therapy is the clinical and evidence-based use of musical interventions to achieve a desired effect (A look at the clinical uses of music therapy, 2020). Research in music therapy supports its usefulness through a wide range of healthcare and educational settings. (Good, Anderson, Ahn, Cong & Stanton-Hicks 2005.)

Music therapy has been and can be used in a wide range of areas. Contemporary music therapy, for example as a different kind of psycho- and physiotherapy, is used in medicine (Dobrzynska, Cesarz, Rymaszewska, Kiejna 2006.). Most often it is used alongside holistic methods of treatment (A look at the clinical uses of music therapy, 2020).

Music therapy is traditionally used in psychiatry and rehabilitation of the disabled. Newer areas of usage are problems with communicating, neurological problems, substance abuse, work related burnout and problems related to pain. (Suomen Musiik- kiterapiayhdistys 2015.) Music therapy is also used in many different areas of

medicine, for example cardiology, geriatrics, paediatrics, surgery and intensive care (Dobrzynska et al 2006).

Music therapy session is always a creative process, in which the client is never expected to be musically talented. Methods used in music therapy are listening to music, singing, playing music, improvisation, moving to the music, making songs, painting to the music and physio-acoustic treatment. (Suomen musiikkiterapiayhdistys 2015.)

Music has a lot of potential. It activates the subconscious mind and can be used to heal. With music, it is safe to deal with difficult issues from a symbolic distance. Music also creates communication, gives aesthetic experiences and brings pleasure. It can be used to either stimulate or calm down, and it is also used to manage pain. (Suomen Musiikkiterapiayhdistys 2015.)

3 Aim, purpose and research question

The aim of this thesis is to find out if listening to music, and music therapy in general, has effects on pain management after a surgery. When combined with pharmacological pain management, the writers seek to find out exactly what effects, if any, music therapy has on the patient's level of pain, thus allowing nurses to have more possibilities in treating post-operative pain.

The research question of this thesis is:

What kind of influence does music have on post-operative pain management?

4 Research methodology

4.1 Literature Review

Emphasis on evidence-based nursing practice, aims for nurses to seek out answers to questions they have that arise from the bedside. In order to identify and evaluate evidence, one method that can be used is to read a review of literature. (Rew 2010.)

Literature review can be described as a research of research. It is done by collecting results from previously done researches that can be used as a base for new researches. (Salminen 2011.)

The purpose or aim is to describe, summarize, and synthesize published findings about a specific problem. The idea is to present these findings in a way that answers the specific question. A clearly stated question focuses attention of the search and maintains boundaries as the process continues. (Whittemore & Knafl, 2005.)

The steps in a systematic review of literature is to first name a specific research question(s) which need to be answered. Then one needs to state the aims and purpose of the review and after that identify inclusion and exclusion criteria. Next step is to select research terms to use, followed by choosing appropriate databases to look for articles and conducting the electronic search. Then review outcome of search that seem to match with inclusion/exclusion criteria, followed by data extraction. Then one needs to determine the quality of studies reviewed and summarize the findings. Next, the researcher interprets the meaning of the evidence retrieved and acknowledges limitations and biases inherent in the process. Lastly, researcher publishes and applies findings in practice (Rew 2010.)

The writers of this thesis decided to use literature review as a method of research because collecting information from different researches done previously allowed the writers to put together a review giving different aspects and results. It was also noted, that doing an empirical study or a development project would have been challenging due to patient privacy policies in Finland, as well as school policies regarding the students interviewing patients.

4.2 Literature Search

After forming the research question and clearly stating the purpose, it is then determined where and how to conduct the review. The search for the material was started on August 2018. Online search engine, Cumulative Index of Nursing and Allied Health (CINAHL) and Google Scholar were used.

Terms for the search came from key words that are found in many public articles. When “music therapy” and “pain” were entered into the CINAHL database, the result is exponential. One cannot possibly read through all the articles, so narrowing down the search proved to be beneficial.

After specifying inclusion criteria, as well as the key words for the search, it was determined which search methods are most likely to have articles that can answer the

specific question. The results from this search become the population from which the articles were taken out for review. (Rew L, 2010). However, before embarking upon a search, a protocol is needed to determine the inclusion and exclusion criteria. Inclusion criteria contains all the things that a study simply must include in order to be deemed suitable for the review. Exclusion criteria are the things that cancel out a study so as to be excluded from the review (Systematic reviews: creating inclusion/exclusion criteria, 2020).

The inclusion criteria were:

- 1 English and Finnish language
- 2 Publication year 2005-2020
- 3 The abstract and/or the title includes before mentioned search terms
- 4 Access to full text
- 5 Accessible for JAMK students

1 Table 1. Inclusion Criteria

After identifying the included articles, the researcher then reads, codes and enters findings on to a data collection instrument such as excel. This is known as data extraction. (Lipp, 2003.) When conducting this thesis the writers read through the abstracts of the articles, and the full article in cases where the articles did not have an abstract, to determine whether they answered the research question and could therefore be used or not. Once the seeker has received the desired literature and

extracted the data to answer their question, the seeker must then evaluate and analyse the data. In analysing the quality of the reviews, the seeker needs to then determine if the criteria of a publication is trustworthy enough to be included within the review. (Cooper, 2010, 10.)

Now that the literature has been read and the data has been extracted, the seeker now needs to interpret the findings and draw their own conclusions (Cooper, 2010, 10). Nursing scholars use different ways to present findings from reviews. This review includes a table that shows the author and date of publication as well as the method used and the main results (appendix 2).

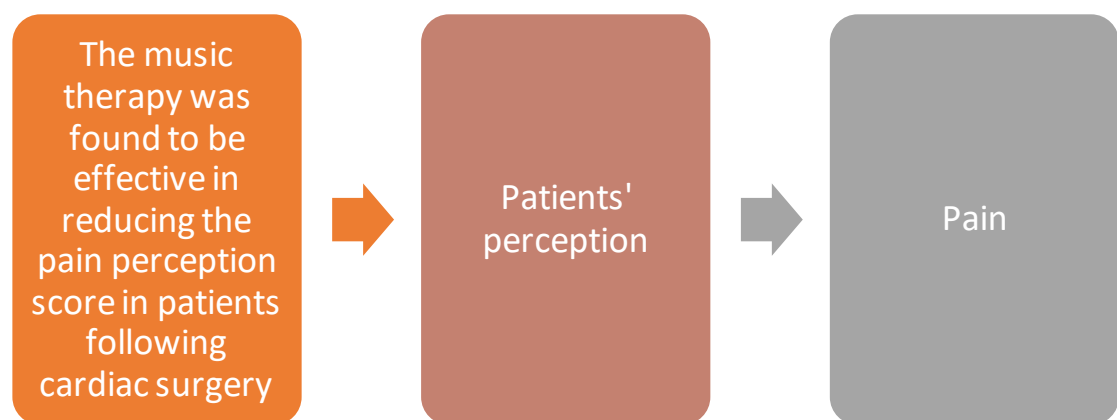
The literature search was conducted using search terms shown in appendix 1. All the used articles were found from Cinahl, using the following search terms: music therapy OR music intervention OR musical therapy AND post-operative OR post-operative OR postoperative OR post-surgery AND pain, as well as Music therapy AND patients' perception AND pain. Not too many articles were found, and the exclusion was fairly easy because many of the articles did not answer our research question.

The articles that did not meet our criteria or did not answer our research question were automatically excluded. Duplicates or copies from the same article were also excluded from the final number of articles. Included articles are shown in appendix 2.

1.3 Data Analysis

In order to break down the information gained from the different articles the method of content analysis was used. Content analysis consists of different phases which categorizes the information to consolidate ideas. Each category is further broken up into different themes which are found within each article. The themes are then arranged in a way that supports or disproves the research question. (Vaismoradi, Jones, Turunen, Snelgrove, 2016.)

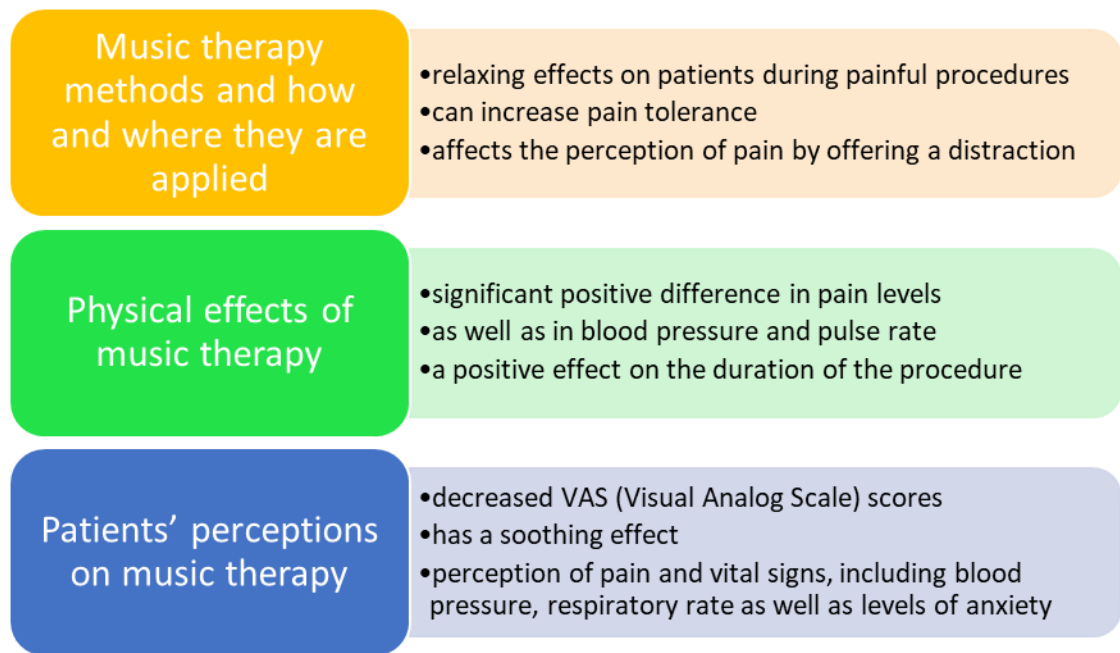
The second phase is forming sub-categories from each article. After having formed each sub-category, the information given is used to form main categories. This will assist the reader to comprehend the information more thoroughly. The categories were formed by theme. Each article was read thoroughly, and common themes were repeated within each. These themes were then connected to form sub-categories which then again, either supports or disproves the research question (Morse, J. M. 1991.) An example of forming categories is shown in Table 2.



2 Table 2. Example of data analysis process.

5 Results

The three main categories we formed are now presented below. The categories are music therapy methods and how and where they are applied, the physical effects of music therapy and the patients' perceptions on music therapy, refer to table 3 below.



3 Table 3. Various uses of Music Therapy.

5.2 Music therapy methods and how and where they are applied

Music therapy is used in clinical environments whereby evidence-based knowledge is used to achieve personalized goals (Good et al. 2005; American Music Therapy Association, 1998). Although music therapy is not commonly used in everyday practice, it has positive outcomes when combined with pharmacological interventions (Cepeda, Carr, Lau & Alvarez, 2006; Nilsson, Unosson & Rawal, 2005; Good et al., 2005; Engwall & Duppils, 2009). Many studies have shown that inactively listening to music by means of radio or headphones is a more effective practice than a purely pharmacological approach (McCormack, Horne & Sheather, 1998; Gooding, Swezey & Zwischenberger, 2012). Music has been known to have relaxing effects on patients during painful procedures and can increase pain tolerance. It also affects the perception of pain by offering a distraction. (R. Balan, S.B. Bavdekar and S. Jadhav, 2009). According to Comeaux and Steele-Moses (2013) music used should be without words, low octaves and contain as little brass and percussion as possible. It is preferred to have a decibel volume of 60.

5.3 The physical effects of music therapy

According to Sfakianakis, Karteraki, Panayiota, Christaki and Chatzikou (2017) a study by Ebneshahidi (2008) was proven to show no significant effects to heartrate, blood pressure or saturation whilst undergoing music therapy during a caesarean section. However, when comparing a group of patients with exposure to music therapy to that of a group without, Jose, Verma and Arora (2012) found a significant positive difference in pain levels, as well as in blood pressure and pulse rates. Music therapy can also have a positive effect on the duration of the procedure in addition to pain management by means of opioid relief (Richards, Johnson, Sparks, Emerson 2007).

5.4 Patients' perceptions on music therapy

In a postoperative setting, decreased VAS (Visual Analog Scale) scores were found in patients that have undergone music therapy (Sfakianakis, Karteraki, Panayiota, Christaki, Chatzikou, 2017). Music therapy has a soothing effect and has shown to reduce pain levels therefore changing moods from unpleasant to pleasant. However, the same study has shown that a large portion of subjects found no positive effects from music therapy to their sleep. They did however feel generally better after listening to music. (Jose, Verma & Arora, 2012).

A study done by Ignacio, Chan, Teo, Tsen, & Goy (2012) showed that pain levels were not remarkably lowered when listening to music compared to those of the control group who did not listen to music on days one and two after the operation. However, according to American Music Therapy Association (2010), there was a significant advantage on patients' perception of pain and vital signs, including blood pressure, respiratory rate as well as levels of anxiety and there was a lesser amount of pharmacological interventions regarding management of pain.

When music therapy is combined with pharmacological interventions, patients' perception of well-being is increased, as well as patients' overall experience of the post-

operative phase (Walworth, Rumana, Nguyen, Jarred, 2008; Comeaux, Steele-Moses, 2013).

6 Discussion

6.1 Ethical Considerations and Reliability

The main ethical matters we suspect are involved with this thesis, include respecting participants, responding to the needs of the patients and of course maintaining their confidentiality is paramount. For example, respecting patients means respecting their decision to not take part in the study. Being aware of different groups that involves children or young adults, is also very important as it may be that they also do not want to take part in the study (Gerrish & Lacey, 2010).

A literature review is based upon conducted researches that have already taken place, the ethical morals of the researchers are often hidden within the different studies or articles. In the making of this thesis, the writers tried to avoid bias and or ethical problems.

A few of the articles or studied the writers used, there were indeed children involved. It begs the question, were the children themselves asked for permission to use their case within the study or just their parents? Were the parents pressured into taking part in the study? Or would their decision compromise the care of their child? Many tools are used when identifying ethical issues. Some qualitative studies refer to them as credibility, trustworthiness and transparency to not give the wrong impression that the study can be completely without bias (Gerrish & Lacey, 2010; Liamputtong, 2013.)

Studies that were review were made in several countries, ranging from the U.S, Greece, India, Australia and more. All of the studies however, were written in English. This gives a tiny perspective of our topic, but it does leave out many countries

around the world. All of our studies related to our topic, post-operative or post-procedural pain. Because of the topic matching, this makes them easily compared from one to the other, but it might also affect and effect the review style. The same things need to be taking into account in the exact same manner. However the results should be found by a different researcher (Gerrish & Lacey, 2010; Liamputtong, 2013.)

6.2 Discussion on results

According to the studies reviewed in this thesis, music therapy can be applied in various settings. It is cost efficient, easy to maintain and easily accessible. When combined with pharmacological pain management, it has shown to relieve anxiety with patients after operations, and in some cases have positive effect on patients' pain levels and vital functions.

All humans have a different pain threshold, and therefore measuring the pain is always based on the patient's own perception. Measuring tools, such as VAS are used to establish the effectiveness of used pain management methods. (Kipu, Käypähoitosuositus 2017.)

Throughout our research we learnt that various procedures, as well as interventions can cause forms of distress and music therapy can relieve the stress caused by said procedures. It is important to relieve the psychological stress, to allow the body to start healing. Based on the results of this literature review, music can act as a distraction and relieve the anxiety a patient might feel after an operation.

Measuring the effectiveness of music therapy in post-operative pain management is mostly based on patients' perceptions. Vital functions can be measured with monitors, but pain and anxiety levels can only be based on patients' own outlook. It is important to remember that patients' own view of their situation is true and should not be doubted. Nurses' job is to listen to the patient and provide the interventions needed to make them feel better. Music therapy should be used in conjunction with analgesic pain management and used according to patients' needs and wishes. In other words, we should work together with the patient to achieve therapeutic pharmacological range. Based on this study, the authors feel that nurses should not assume the patients' situation, but rather talk to them and make a plan about the usage of music as a pain management method.

When combined with pharmacological pain management, music therapy has a lot of positive effects. Unlike medications, music therapy has no adverse effects. When used together with pharmacological interventions, it can lower the amounts of medication needed, and therefore lower the risk of adverse effects.

All in all, music therapy can be an inexpensive and easy way to help the patients to cope with the stress caused by operations. The writers perceive it as a method that could be widely spread throughout different economic situations and settings. In other words, everyone can have access to music therapy, and by educating nurses about the benefits of using music therapy, it could be used subliminally. Other studies that could dig deeper into this field could contain some of the following ideas, the effect of music therapy and cognitive function, the effect of music therapy amongst sufferers of eating disorders, the effect of music therapy in acute situations, for example.

References

A look at the clinical uses of music therapy, 2020. Retrieved 5.8.2020 from <https://positivepsychology.com/music-therapy-clinical/>

Addiction A-Z, 2018, addiction.com
Cited: 23.11.2018
Retrieved: <https://www.addiction.com/a-z/music-therapy/>

American Music Therapy Association, music therapy makes a difference, 2004.
Retrieved 1.11.2018 from www.musictherapy.org

Balan, R., Bavdekar, S. B., & Jadhav, S. 2009. Can Indian classical instrumental music reduce pain felt during venepuncture?. The Indian Journal of Pediatrics, 76(5), 469-473.

Barcelos, V., Teixeira, E., Ribeiro, A., Braga da Silva, L., Rodrigues, D., Siqueira, A., 2018, Music Therapy In Patients With Mental Disorders, J Nurs UFPE on line., Recife, 12(4). 1054-1059

British Association for Music Therapy. What is music therapy. 2018
Retrieved 2.11.2018 from www.bamt.org/music-therapy/what-is-music-therapy.html

Cepeda, M. S., Carr, D. B., Lau, J., & Alvarez, H. (2006). Music for pain relief. Cochrane database of systematic reviews, (2).

Comeaux, T., & Steele-Moses, S. 2013. The effect of complementary music therapy on the patient's postoperative state anxiety, pain control, and environmental noise satisfaction. Medsurg nursing, 22(5)..

Cooper, H. 2010. Research synthesis and meta-analysis: A step-by-step approach 4th ed. Los Angeles: Sage.

Dobrzynska., E, Cesarz, H., Rymaszewska, J., Kiejna, A., 2006, Music Therapy- History, definitions and application, Archives of psychiatry and psychotherapy, 8(1), 47-52.

Duerksen, G. L., 2014. "Music therapy." Grove Music Online. Oxford Music Online. Oxford University Press
Cited: 23.11.2018
Retrieved: <http://www.oxfordmusiconline.com/subscriber/article/grove/music/A2257019>

Ebneshahidi, A., & Mohseni, M. 2008. The effect of patient-selected music on early postoperative pain, anxiety, and hemodynamic profile in cesarean section surgery. *The journal of alternative and complementary medicine*, 14(7), 827-831.

Engwall, M., & Duppils, G. S. 2009. Music as a nursing intervention for postoperative pain: a systematic review. *Journal of perianesthesia nursing*, 24(6), 370-383.

Gerrish, K. & Lacey, A. 2010. *The Research Process in Nursing*. 6th Edition. P. 24. – 432.

Good, M., Anderson, G., Ahn, S., Cong, X., Stanton-Hicks, M., 2005, Relaxation and music reduce pain following intestinal surgery, *Research in Nursing and Health*, 28(3), 240-251.

Gooding, L., Swezey, S., & Zwischenberger, J. B. 2012. Using music interventions in perioperative care. *Southern medical journal*, 105(9), 486-490.

Ignacio, J. J., Chan, M. F., Teo, S. H., Tsen, L. M., & Goy, R. 2012. Research in brief — The effect of music on pain, anxiety, and analgesic use on adults undergoing an orthopaedic surgery: A pilot study. *Singapore Nursing Journal*, 39(4), 49-51.

International association of the Studying of Pain. Definition of Pain. 2017 Cited 20.11.2018 from <http://www.iasp-pain.org/terminology?navItemNumber=576#Pain>

Johnson, M. H., Breakwell, G., Douglas, W., & Humphries, S. 1998. The effects of imagery and sensory detection distractors on different measures of pain: how does distraction work?. *British Journal of Clinical Psychology*, 37(2), 141-154.

Jose, J., Verma, M., & Arora, S. 2012. An Experimental Study to assess the Effectiveness of Music Therapy on the Post Operative Pain Perception of Patients Following Cardiac Surgery in a Selected Hospital of New Delhi. *International Journal of Nursing Education*, 4(2), 198-201.

Kipu. Käypä hoito -suositus. Suomalaisen Lääkäriseuran Duodecimin, Suomen Anestesiologiyhdistyksen ja Suomen Yleislääketieteen yhdistyksen asettama työryhmä. Helsinki: Suomalainen Lääkäriseura Duodecim, 2015 (retrieved 20.11.2018). Online access : www.kaypahoito.fi

Kivunhallintatalo, “Akuutti eli äkillinen kipu”. Retrieved 20.11.2018 from <https://www.terveyskyla.fi/kivunhallintatalo/perustietoa-kivusta/akuutti-eli-%C3%A4killinen-kipu>

Kivunhallintatalo, "Kipua esiintyy monenlaisissa tilanteissa". Retrieved 20.11.2018 from <https://www.terveyskyla.fi/kivunhallintatalo/perustietoa-kivusta/kipua-esiintyy-monenlaisissa-tilanteissa>

Kipu. Käypä hoito -suositus. Suomalaisen Lääkäriseuran Duodecimin, Suomen Anestesiologiyhdistyksen ja Suomen Yleislääketieteen yhdistyksen asettama työryhmä. Helsinki: Suomalainen Lääkäriseura Duodecim, 2015. Retrieved 29.3.2020 from www.kaypahoito.fi

Kontinen, V., & Hamunen, K. 2015. Leikkauksen jälkeisen kivun hoito. Duodecim, 131(20), 1921-1928.

Liamputtong, P. 2013. Research Methods in Health - Foundations for evidence-based practice. 2nd Edition. P. 16. – 376.

Lipp, A. 2003. A guide to developing a systematic review. AORN Journal, 78, 90–107

Manworren, R. C. 2015. Multimodal pain management and the future of a personalized medicine approach to pain. AORN journal, 101(3), 307-318.

Morgan, A. T. 2010. Dysphagia in childhood traumatic brain injury: A reflection on the evidence and its implications for practice. Developmental Neurorehabilitation, 13, 192–203.

Morse, J. M. 1991. Approaches to qualitative-quantitative methodological triangulation. Nursing Research, 40(1), 120–123.

Nilsson, U., Unosson, M., & Rawal, N. 2005. Stress reduction and analgesia in patients exposed to calming music postoperatively: a randomized controlled trial. European journal of anaesthesiology, 22(2), 96-102.

Rew, L., 2010. The systematic review of literature: Synthesizing evidence for practice, Journal for Specialists in Pediatric Nursing 16, 2011, 64–69.

Richards, T., Johnson, J., Sparks, A., & Emerson, H. 2007. The effect of music therapy on patients' perception and manifestation of pain, anxiety, and patient satisfaction. In Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews. Centre for Reviews and Dissemination (UK).

Salminen, A. 2011. Mikä kirjallisuuskatsaus? Johdatus kirjallisuuskatsauksen tyyppeihin ja hallintotieteellisiin sovelluksiin. Vaasan yliopiston julkaisuja. 1-44.

Sfakianakis, M. Z., Karteraki, M., Panayiota, K., Christaki, O., & Chatzikou, V. 2017. Effect of Music Therapy Intervention in Acute Postoperative Pain among Obese Patients. *International Journal of Caring Sciences*, 10(2), 937.

Suomen Kivuntutkimusyhdistys ry. Mitä kipu on? Perustietoa kivusta kaikille. 1-5.

Suomen Musiikkiterapiayhdistys. 2015. Retrieved 2.12.2018 from <http://www.musiikkiterapia.net/index.php/mita-musiikkiterapia>

Systematic reviews: creating inclusion/exclusion criteria. 2020. Duquesne University. Cited 5.8.2020 from <https://guides.library.duq.edu/systematicreviews/criteria#:~:text=Inclusion%20criteria%20is%20everything%20that,%2C%20population%2C%20outcomes%2C%20etc.>

Vaismoradi, M., Jones, J., Turunen, H., Snelgrove, S. 2016. Theme development in qualitative content analysis and thematic analysis. *Journal of Nursing Education and Practice*, Vol. 6, No. 5, 100-110.

Whittemore, R., & Knafl, K. 2005. The integrative review: Updated methodology. *Journal of Advanced Nursing*, 52, 546–553.

8 Appendices

8.1 Appendix 1. Literature search

Database	Search terms	Results	Chosen based on the title and abstract	Relevant studies
Cinahl	Music therapy OR music intervention OR musical therapy AND post operative OR post-operative OR postoperative OR post surgery AND pain	28	6	6
Cinahl	Music therapy AND patients' perception AND pain	4	1	1

8.2 Appendix 2. Table of articles

Author Year Publication	Objective	Method	Main results
<p>Balan, R., Bavdekar, S. B., & Jadhav, S.</p> <p>2009</p> <p>Can Indian classical instrumental music reduce pain felt during venepuncture? The Indian Journal of Pediatrics, 76(5), 469-473.</p>	<p>To compare the effects of local anaesthetic cream, classical Indian instrumental music and placebo in lowering pain levels during vena puncture in children</p>	<p>Randomized clinical trial</p> <p>3 groups of 50 children (Local anaesthetic, music, placebo)</p>	<p>Both local anaesthetic and classical Indian instrumental music can notably reduce the experienced pain related to vena puncture.</p>
<p>Comeaux, T. & Steele-Moses, S.</p> <p>2013</p> <p>The effect of complementary music therapy on the patient's postoperative state anxiety, pain control, and environmental noise satisfaction. Medsurg nursing, 22(5).</p>	<p>To determine if music therapy can be used as a supportive measure to relieve anxiety and support pain management in post-operative patients</p>	<p>Participants divided in 2 groups</p> <p>Control group received standard care; intervention group received music therapy in addition of standard care.</p>	<p>Music therapy had no effect on state anxiety, but did decrease pain and environmental noise perception.</p>
<p>Ignacio, J. J., Chan, M. F., Teo, S. H., Tsen, L. M., & Goy, R.</p>	<p>To determine effects of music on orthopaedic surgical patients' pain, anxiety and analgesic usage compared to not listening to music</p>	<p>Sample of 21 patients, 12 in the music group and 9 in non-music group</p> <p>Measurements used were pain (VAS), anxiety (State Trait Anxiety Inventory) and usage of analgesia</p>	<p>Music had positive effects on anxiety on POD2</p> <p>Music reduced pain levels on POD 1 and 2</p>

<p>2012</p> <p>Research in brief— The effect of music on pain, anxiety, and analgesic use on adults undergoing an orthopaedic surgery: A pilot study. Singapore Nursing Journal, 39(4), 49-51.</p>		<p>Research was done during post-operative days (POD) 1-3</p>	<p>Music had no significant difference for analgesia usage</p>
<p>Jose, J., Verma, M., & Arora, S.</p> <p>2012</p> <p>An Experimental Study to assess the Effectiveness of Music Therapy on the Post Operative Pain Perception of Patients Following Cardiac Surgery in a Selected Hospital of New Delhi. International Journal of Nursing Education, 4(2), 198-201.</p>	<p>Gaining knowledge on patients' perception of post-operative pain before and after the introduction of music therapy</p> <p>To compare blood pressure and heart rate before and after the introduction of music therapy</p>	<p>Experimental study</p> <p>64 patients randomly divided to experimental and control group</p>	<p>Music was determined to have notable effect on post-operative pain, blood pressure and pulse.</p> <p>Patients' perception on music therapy was positive (relaxation, reduced pain levels)</p>
<p>Richards, T., Johnson, J., Sparks, A., & Emerson, H.</p> <p>2007</p> <p>The effect of music therapy on patients' perception and manifestation of pain, anxiety, and patient satisfaction. In Database</p>	<p>To determine the clinical benefit of using music therapy in clinical settings</p>	<p>Literature review</p>	<p>Different studies offered variations on the effect of music therapy on post-operative pain</p> <p>Most studies showed no statistical significance in anxiety levels</p>

of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews. Centre for Reviews and Dissemination (UK).			
<p>Sfakianakis, M. Z., Karteraki, M., Panayioti, K., Christaki, O., & Chatzikou, V.</p> <p>2017</p> <p>Effect of Music Therapy Intervention in Acute Postoperative Pain among Obese Patients. International Journal of Caring Sciences, 10(2), 937.</p>	<p>To gain knowledge on the effects of music therapy on post-operative pain after abdominal surgery on obese patients</p>	<p>Randomized clinical trial</p> <p>Data collected from patients before and after implementation of music therapy</p> <p>Music therapy group of 42 patients, non-music therapy group of 42 patients</p> <p>Visual analogue scale (VAS) used to determine pain levels</p>	<p>From all study variables only VAS and mean arterial pressure (MAP) were found to be affected from implementation of music therapy</p>