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RESEARCH ARTICLE

EFFECT OF NON-PHARMACOLOGIAL INTERVENTION IN BURNS: A NARRATIVE REVIEW

Resmi L.
Ph.D.(Nursing)Student.

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Abstract

Introduction:-

The treatment and dressing process of burn patients have been a challenging process being a severe traumatic experience for burn patients. Even with the advancement of medical technology that has improved nutritional support, antibiotic administration and the dressing process easier, however, burn patients go through varied psychological and physiological challenges during the dressing and treatment process. During the recovery process of burn patients, pain is one of the aspects that need to be managed effectively so that the immune system of the patient does not get deteriorated. With the limitation of analgesics and sedation in burn patients, holistic approaches need to be considered in addressing the emotional condition of the burn patients, thereby easing up their anxiety and pain. Music interventions have been established to have a positive impact on the rehabilitation and treatment process. Medical institutions have already been using music interventions in surgeries and chemotherapy processes to ease the anxiety and pain of patients. The current narrative review will explore the effectiveness of music intervention while dressing burn patients.

Objective:-

To understand the effectiveness of music therapy in reducing the pain and anxiety of burn patients during their burn dressing compared to the usual treatment

Literature Review:-

The extent non-pharmaceutical intervention can reduce pain in burn patient

Patients suffering from severe burns have to go through psychological and physical pain. Therapeutic procedures which consist of a change of dressings, cleaning the wound and debridement are painful experiences. Even though burns can be categorized into area, severity and depth, pain cannot be classified and correlated. The intensity of pain varies from one individual to the other. This can vary based on the threshold, physiologic responses and coping abilities of the individual. As highlighted by Scheffler et al. (2018), burn pain is maximum while the patient is going through wound debridement and therapeutic procedure. The most common pharmacological approaches include the use of analgesics that are helps with procedural pain. Nevertheless, in spite of responding to the procedural treatments burn patients experience excruciating pain. There are also instances when the patients do not respond to opioid treatments. In addition, the analgesic administration has several side effects like respiratory depression, constipation, sedation, risk of psychological and physical dependence and nausea.

Corresponding Author:- Resmi L.
Address:- Ph.D.(Nursing) Student.

As explained by Rohilla et al. (2018), the experience of pain can be due to various components that can differentially affect a burn patient. For instance, the pain has a sensory component where the patient feels different intensities of pain. While it also has an affective aspect where pain brings a feeling of unpleasantness. Further pain also has a cognitive aspect which comes when the patient thinks about the pain. The main goal of non-pharmaceutical interventions is to assess and overcome the different pain components so that mental distress can be reduced in burn patients. As mentioned by Li et al. (2017) some of the non-pharmacological care processes for burn patients includes personal communication, using virtual reality, and audio and video recordings.

As explained by Fardin et al. (2020) distraction of the patient helps to divert the mind of the patient to other pleasant stimuli which helps in lessening the perception of pain. These interventions help in sensory focusing on the distraction that reduces the distress caused during the dressing of their wounds. Moreover, utilizing sensory focusing brings positive impacts on the painful memories of the patient. Further as added by Griggs et al. (2017), non-pharmacological interventions like audio clips help in reducing the pain arousal of the patient to a sympathetic tone. These relaxation techniques help in changing the perception of pain in the patients leading to muscular relaxation.

Effect of Music Therapy on pain and anxiety

According to Gazeljeh et al. (2017), music has a positive impact on the central nervous system causing distraction and relaxation in the burn patient. Further, it has been observed by Umbrello (2019), that with the regular utilization of music intervention, patients show an improvement in their physical as well as mental health. As highlighted in the recent study by De Jong et al. (2007), music therapy helps in reducing chronic pain like fibromyalgia. Similarly in the cancer patient, music therapy has improved the quality of life by reducing the associated pain. Evidence from the study by Kim et al. (2019), shows that with music intervention medical professionals can lower the level of pain in addition to the standard care of analgesic used for pain reduction.

Music therapy has evidence-based utilization in the therapeutic process of a patient so that the emotional, cognitive and physical needs of the patient can be met. Music also shows positive results in reducing the anxiety of terminally ill patients. At times music listening has a preoperative role to reduce the stress, fear and anxiety of the patients. In case of burn injury, the patient goes through painful trauma. As a result, postburn pain management can be a complex process depending on the intensity and quality of pain the patient is suffering from. If sufficient pain management treatment is not provided to the burn patient it often leads to posttraumatic stress disorder. Hence in these cases, a multimodal analgesic procedure needs to be adopted.

As explained by Najafi Ghezeljeh et al. (2016), music can be a complementary therapy for reducing pain used often by nurses. Evidence presented by Zhang et al. (2020), highlights that music has the ability to improve a patient's wellness. It helps induce relaxation, masking the negative stimuli presented by pain, anxiety or stress. Further music is observed to interfere with the autonomic nervous system and have a beneficial effect on the immune system and on neurohormonal activities. According to Ghezeljeh et al. (2017), music helps in enhancing the level of immunoglobulin A which works on the regenerative processes as well as on the emotional responses.

The psychological impact of music on burn patients

As mentioned by Li et al. (2017), music interventions have a strong positive impact on patients suffering from preoperative stress and anxiety. This is applicable in the case of burn patients because in many cases the burn patients are kept in ICU and mechanical ventilation. Music interventions show that they reduce the pain score with improvement in the heart rate, satisfaction score and arterial pressure. Music therapy helps the brain to release dopamine and lowers the cortisol hormone known as the stress hormone. Further, it increases focus and improves cognitive tasks. It helps in processing pain reactions and improves the actions of medication on burn patients.

Music can have multiple aspects on the psychological condition of the patient. According to Ghezeljeh et al. (2017), evidence-based nursing highlights that music provides faster wound healing and comfort. Pain in a burn patient can be categorized into affective motivation and sensory discriminative aspects. With a non-pharmacological approach like music therapy, the patient can acquire clinical pain reduction Further the sensory discriminatory factor allows the patient to overcome the unpleasant feeling and negative experience due to tissue damage which further brings relief to the patient. As highlighted by Markiewicz-Gospodarek et al. (2022) nerves like the dorsal horn within the spinal cord that involves in controlling pain. Pain provides nerve signals within the grey matter and then to the

spinal cord. This acts as a gate which can be closed with impulses uploaded to the brain. This theory is called the gate control theory.

According to Rohilla et al. (2018), music interventions can generate music-based imagery in mind that helps in improving the psychological condition of the patient. These images can be activities where the patient was involved with music like singing together with family, singing familiar songs or playing music. With musical rhythm, deep breathing is encouraged to alleviate pain and anxiety, especially during the debridement process of the wounds. In another study carried out by Zhang et al. (2019) while carrying out pharmacological treatment with medications like tramadol the severity of the pain was reduced to moderate. However, the effectiveness of the medication improved with the music intervention as the patient started responding positively to the treatment due to decreased anxiety and pain.

Challenges of dressing process in Burn patients

According to American Burn Association, burn patients can be categorized into the following divisions. They can be severe burns, second-degree burns with burns covering 25% of the body in an adult or 20% of the body in children. It can be a third-degree burn that covers 105 of the surface area of the body (Rogers &Jeschke, 2016). Further, there are respiratory and electric burns where the complications can affect areas like the eyes, face, feet perineum, and hands. There is medium and light burn where the patient is affected by a burn of 15% and 10% of the body. Burns can lead to losing the aesthetic value of the skin and the elevation of scar tissue. Further, there can be itching which is due to histamine production resulting in the feeling of needles on the skin. In the case of hypertrophic scars there, dressing change is one of the gold standards for wound healing. This allows removing of the necrotic tissues and the application of hydrogels and hydrocolloids.

Patients who have suffered from at least 15% burns in their body develop an acute systemic inflammation with multi-organ dysfunction. Due to the above condition, the patient is prone to show symptoms of bacteremia which can lead to organ failure and sepsis. Dressing the wound is crucial to ensure that the wound is cleaned to avoid any septic complications. Infectious complications not only increase the treatment time but also increases the mortality rate. Further, the pathogen virulence enhances in case the patient is aged and suffers from conditions like hypertension, diabetes and obesity (Markiewicz-Gospodarek et al., 2022).

Another challenge of a burn wound is that if the dressing is not done appropriately, it gets contaminated with gram-positive cocci and gram-negative bacteria which further reduces the healing pace of the wound (Markiewicz-Gospodarek et al., 2022). The opportunistic pathogens decrease the immunity of the patient. The denatured, dead tissue with its surrounding moist environment of the wound increases the susceptibility to Pseudomonas infection. Burns also result in musculoskeletal changes which result in heterotrophic ossification, contractures, septic arthritis and bone loss.

As explained by Rogers and Jeschke (2016), one of the pathophysiological conditions of the burn patient is oxidative stress development. Perfusion in the ischemic tissues due to burning trauma creates an imbalance in the RTF or reactive oxygen species. Due to this the vascular permeability as well as peroxidation of the plasma membrane increases. This leads to severe pain in the patients. The autocatalytic reaction due to peroxidation leads to toxic metabolism as well as cell apoptosis. This creates further difficulty in the healing of the wound in the patient.

Methodology:-

Selection Criteria

The literature and studies were selected based on certain inclusion and exclusion criteria. The inclusion criteria of the literature include the articles that involved research on burn wound dressing, non-pharmacological techniques like music therapy on burn wound patients, dressing challenges in burn wound patients and the effectiveness of music therapy in stress reduction for burn patients. Further, the articles and literature selected were published in the last 15 years. The exclusion criteria included research papers on the pharmacological treatment process of burn wound dressing, music therapy on patient conditions other than burn wounds, and research papers which are published in other languages other than English. Literature that is older than 15 years was excluded from the study.

Searching

The journals and literature were selected from sites of Indian journals of plastic surgery, databases like PubMed, Cochrane Library for controlled trials study, UMI ProQuest, CINAHL and Google Scholar. The articles selected

were published between 2007 to 2022. Some of the keywords that were used in searching the appropriate articles include burn wound dressing, music therapy, stress and anxiety in burn patients, music therapy for burn patients, and burn healing challenges.

Data collection and data analysis

The data is collected qualitatively from the literature that was selected on the basis of the inclusion criteria. The collected data were aligned based on the requirement of the review objective. The information collected on the effectiveness of the music therapy on the burn patient was aligned with its effectiveness in wound dressing. The literature was analyzed following a thematic analysis. This allowed the researchers in analyzing the available information and interpreting the patterns of the level of pain score reduction with music therapy.

Study quality

The study quality was maintained by reviewing the evidence that is portrayed by the researchers. The possible biases in the data based on which the final conclusion can be drawn were avoided. However, there are possibilities of unintentional bias in terms of inordinate weight on a few articles compared to the others in the narrative review.

Findings

It is evident from the study of Griggs et al. (2017), that in spite of improvement in the modern care processes for burns, there still exists an inconsistency in terms of pain management at different stages of its treatment process. As a result of insufficient management of pain in burn patients especially during dressing, there is a high rate of morbidities with post-traumatic stress and long-term anxiety observed in the patients. Hence it was established pharmacological standardized approaches were inadequate in addressing the sufferance of the burn patient.

In the randomized control study carried out by Scheffler et al. (2016), it was observed that non-pharmacological practices like music shows a significant impact on the stress and anxiety of burn patients. Further, the findings of the study showed that listening to music results in the stimulation of competitive sensory input which allows the nerve impulses to reduce the sensation of pain threshold. As a result, the pain experienced by the burn patient is reduced. Learned behaviour and distraction explain this gate control theory where music attracts the attention of the patient thereby reducing the exhaustion of pain and distribution of anxiety.

Ghezeljeh et al. (2015) in his findings explained that music has pain-relieving impacts when compared with the control group where the patients were only treated pharmacologically. His study highlighted that the level of pain continues to remain low before and after dressing with music therapy. In addition, it was observed that even though the range of motion of the patient has not changed before and after the dressing, the psychological condition of the patients under music therapy was observed to be elevated compared to the control groups. Further Ghezeljeh et al. (2015) explained that during their study they explored the gate control theory to evaluate the effect of music on burn patients, especially during their dressing. The results in the patients emphasize that music plays an instrumental role in meeting the psychological and physical needs of the patient as it stimulated the level of comfort and relaxation. Even though the music does not directly impact the rate of treatment of the wound, however with the reduced anxiety and stress, the level of muscle tension also reduces during the wound dressing. With a significant decrease in stress, the cortisol level also reduces. Hence the patient is shown to have a decreased rate of respiration and blood pressure while dressing which helps in faster healing of the wounds. The study carried out by Jong et al. (2007) revealed that narrative synthesis of 26 studies showed that 15 studies support the positive impact of music therapy on the treatment of the burn patient. While two reported that the level of distress was reduced during the dressing of the burn patient. Jong et al. (2007) also highlighted that the distraction technique using music in supplementary with the analgesics reduced the pain intensity of the severely burned patients.

Rohilla et al. (2018) in their study while explaining the protocol for music therapy highlighted the selection of music based on four main categories. These were spiritual or religious music, classical instruments, western music and Bollywood music. The pain score including the heart rate and blood pressure level of the patient was monitored 30 mins before and after dressing the wound of the burn patient. The results of the study explain that the patients showed a radical decrease in pain levels with a median anxiety score. Further, the use of analgesics is common during the dressing of the wound. However, in the study, it was observed that the patient under music therapy required lesser analgesic support compared with the control group that was not provided with music therapy. The results were convincing enough for the researcher to conclude that music has a distracting and soothing role in the wound dressing of burn patients.

The effect of music was further accelerated when the patient selected their preferred music or listened to a pre-recorded audio which was self-selected. The study also emphasized the positive impact of participatory music and live music that improves the response of burn patients. Zhang et al. (2018) explained in their findings that burn patients develop fear and anxiety considering the dressing process which involves dressing removal, cleaning, debridement of the wound and fresh dressing as a painful process. It was evident in his study that music therapy plays an important role in reducing the negative emotional experience and reducing unpleasant feelings in burn patients.

Conclusion:-

It can be concluded that the process of pain management in burn patients is crucial during the dressing of the wound. Since pain and its related anxiety is a challenge for the burn care team, alternate and non-pharmacological approaches like music therapy are employed for reducing the level of pain and anxiety. Analgesics and morphine use are observed to be insufficient in reducing the psychological trauma of the burn wound dressing. Hence it can be concluded that with the help of music therapy, it is possible for the burn care professional to alleviate the level of pain and improve the wound healing of the patient. The narrative study hence will be effective for future studies on the use of music therapy in the treatment of other critical illnesses supplementary to pharmacological support.

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