AUDITORY STIMULATION OF QUR’ANIC MUROTTAL ON PATIENT WITH TUBERCULOUS MENINGITIS

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Abstract

Objective: One of serious complications of tuberculosis is tuberculous meningitis that affects the brain. Headache and pain are among clinical signs manifesting in patient with TB meningitis. Modification of interventions to treat pain in clients with TB meningitis is necessary. Providing stimulation of Qur'anic Murottal as an effort to relieve pain may be used as a modification of intervention.

Methods: This study used case study analysis of patient with meningitis TB in Neurology Ward of RSCM for 7 days. Patient was provided with murottal al qur'an stimulation for seven days and the level of pain was evaluated by using Adult Nonverbal Pain Scale instrument.

Results: The study result indicated that there was a decrease in pain level according to Adult Non-Verbal Pain Scale (ANVPS) score from 7 to 1.

Conclusion: The development of further research in audio stimulation application of murottal al qur'an on client with TB meningitis should be conducted as an innovation of nursing intervention for client affected by pain, especially TB meningitis.

Keywords: meningitis, murottal al qur’an, pain, tuberculosis

Introduction
Indonesia is one of developing countries with high density population. The population density is not evenly distributed throughout Indonesia, but is concentrated in several major cities. Unequal population density is caused by urbanization. It is projected that by 2035 the level of national urbanization in Indonesia will reach 66.6%, with DKI Jakarta claimed the highest percentage of urbanization in 2035 reaching above 801. The high rate of urbanization will certainly have its own impact or impact on the life of big cities in Indonesia, one of which will have an impact on the health aspects of urban society.

One of the health problems caused by population density that spread through the respiratory tract is TB (tuberculosis). The most severe complication of tuberculosis that may affect human brain is called tuberculous meningitis. TB meningitis is one of the serious complications due to invasion of TB bacteria into brain tissue. TB meningitis occurs when M. tuberculosis bacteria enters the brain causing inflammation and the brain will show a decline in function. Inflammation also results in pain due to increased pressure within the brain. Meanwhile, decreased brain function can cause an altered consciousness.

Some interventions that could be provided include providing a stimulus that triggers brain work or stimulation that prevents worsening of the brain's functions. The stimulations include touch, sound and light activity. Several previous studies suggested that one of the interventions that could be applied in neurological rehabilitation was music-based intervention. These interventions include listening to music, singing, or playing a musical instrument. The results of previous studies showed the influence of music-based intervention on cognitive function,
motoric and emotional function in patients with several neurological disorders. Music-based interventions provide positive impact on motor movements, speech, and cognitive abilities in clients\(^2\). Music-based therapy is also an effective intervention to be applied to clients with chronic pain, migraine, and clients with chronic tinnitus\(^3\).

Several experimental studies have been conducted to analyze music therapy for pain. One of the study suggested that there were statistical differences that showed clients provided with music therapy had a 70% greater likelihood of a 50% reduction in pain than clients who did not listen to music\(^4\).

Music therapy can be modified according to the characteristics of the patient and family. One of the music therapies that can also be applied by prioritizing the spiritual aspect is listening to al-qur'an. Previous studies related to audio stimulation analysis of murottal al-qur'an Ar-rahman's letter was performed at maternal labor when 1\(^{st}\) phase was active.

Based on the aforementioned phenomena and descriptions, authors were concerned to analyze the application of the intervention of music stimulation modification by using murottal al-qur'an in nursing clinical practice with a health approach to urban problems. Audio stimulation intervention with murottal al-qur'an was applied to client with TB meningitis affected by headache and treated in neurology ward of Cipto Mangunkusumo Hospital.

Method
This study method was case study. This study was conducted by conducting a literature study on pain intervention modification, then applying it to client for seven days. After seven consecutive days of intervention, an evaluation of murottal al qur'an audio stimulation of TB meningitis client pain was carried out.

Result
After initial assessment, data analysis was obtained with three main nursing problems. The three main nursing problems based on data analysis included ineffectiveness of airway clearance, ineffectiveness of cerebral tissue perfusion, and acute pain. Then, the intervention of nursing care was provided to client for seven days. One modification of the intervention was applied on the problem of headache felt by the client. In the initial assessment of pain using the Adult Nonverbal Pain Scale, the client's pain score was 7 or severe pain.

Interventions were provided with the following conditions:

a. The intervention was applied whether the client did or did not feel pain.

b. The stimulation provided was murottal al-qur'an of Juz 2.

c. The stimulation is provided by using a rotating device via a cellphone connected to the headset to the client's ear.

d. Pain assessment was performed at the initial assessment and every day after the intervention is given.

e. The stimulation was given for 30 minutes.

f. The stimulation was given at 10.00 WIB and 16.00 WIB, twice in one day.

After the intervention was applied for 7 consecutive days, the client showed development on the seventh day as indicated by no signs of headache both during the day and at night. In addition, stiffness in both client extremities after observation appeared to be reduced. Following is the table of client development after being provided with audio stimulation intervention of murottal al-qur'an.

### Table 4.2 Evaluation

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Discussion
Based on the results of the intervention, the client experienced a decrease in pain level after provided with intervention for the past 7 days. On the last day, the client showed no signs of grimacing and decreased stiffness in the extremities. Both client extremities were more relaxed than previous position which suggested abnormal flexion, but on the last day of intervention the upper limb was straight along the body line. The client's fingers were more flexible and the range of movement of the client joint increased. The family also said that clients did not show signs and symptoms of pain at night and could sleep soundly.

During the intervention procedure, the client seemed calm, responding occasionally to the eye followed by eye movements that have not followed the response.
He was also asleep during the intervention. The client's facial expression generally showed a calm expression without grimace or frown. Based on the results of the 7-day intervention process, murottal al-qur'an therapy was effective on pain in recovery phase characteristics. The client had gone through the critical phase of the main pathological condition which generated headache with a scale of severe headache with a scale of 7 points to mild (score 3-6). Client with severe pain scale 8-10, especially in the critical phase require additional intervention including the medication and primary treatment of the main pathological conditions of the client which caused by inflammation of the brain. Murottal al-qur'an audio stimulation is also effective as one of the programs planned for home care, so that it may included as a point of education in discharge planning to the families before client is discharged and doing home-care.

Decreasing level of pain can also be explained through hormonal mechanisms. A study was conducted experimentally on two intervention and control groups. In the intervention group given music therapy there was a decrease in cortisol levels, while in the control group that did not use music therapy there was an increase in cortisol levels.

The same thing was also applied in studies that analyzed the effect of murottal quran therapy on pain in clients with burns. The results of the study showed that the treatment of listening to the Qur'an reduced pain scale up to 2 scales. An investigation also revealed that the effects of music therapy on clients with burn and showed positive correlation between music stimulation and lower level of pain, anxiety, and pulse in patient with burn. This indicates that the provision of audio stimulation of music or murottal alqur'an to the clients provides great benefits for client’s comfort.

The application of music stimulation can be explained scientifically and evidenced by evidence-based through the explanation that gate control theory can reduce the level of pain. This theory explains that somatosensory stimulation (such as palpation, joint stiulation) in the five senses can generate nerve impulses that will be transmitted by three systems located on the spinal cord. The three systems include substantia gelatinosa on the dorsal horn, dorsal column fibers, and the center of cell transmission that affects the nociceptor impulse. Pain stimulation is influenced by the 'gate mechanism'. When the gate closes, stimulation of large nerve fibers will inhibit the transmission of pain. However, stimulation of small nerve fibers makes the gate open. This gate mechanism is affected by descending nerve impulses from the brain. This theory explains that large nerve fibers can activate selective cognitive processes through the modulation properties of the spinal cord.

The theory also proposes that sensory modulation of pain depends on stimulation of interneurone inhibitors between first-order nociceptive neurons of peripheral-order nociceptive neurons and second-order spinal tracts. When stimulation is given by A-delta fibers, the gate will open, and interneurons allow the transmission of pain to the brain. The interneuron is also stimulated by a neurotransmitter glutamate from the large-diameter A-beta sensory fibers that transmit sensations such as touch or pressure. When stimulated by A-beta fibers transmission of the sensation of pain through the interneuron is inhibited and the 'gate' is said to be closed. That way, inhibitory interneurons can affect the descending inhibitory pathways of the brain. These descending neurons secrete neurotransmitters, such as serotonin and adrenaline which will suppress pain. Inhibitory inhibitors also secrete peptides such as endorphins and encephalians which are natural opioids and inhibit pain.

This explains that psychosocial support for clients with pain will have a major influence on decreasing client’s pain levels. The action of rubbing the area hit on the body, relaxation with touch, relaxation with audiovisual stimulation are some efforts that utilize the gate control theory to reduce the level of pain with non-pharmacological management. Therefore, giving the intervention of audio stimulation of music to client with pain can be done as an effort to reduce the level of pain. In addition, somatosensory stimuli on clients can also be applied through passive ROMs and touches from nearby families.

Listening to music scientifically is also able to improve the connectivity of brain neurons in healthy individuals. Meanwhile, musical activities can also increase neuronal plasticity and induce white matter changes and gray matter in some parts of the brain. An experiment also indicated that that the level of pain in the intervention group experienced a significant decrease compared to the control group.

Audio or auditory stimulation is not only in the form of murottal quran. Previous research has also been conducted by analyzing audio stimulation with various
types of music. One research that analyzes music therapy as one of neurologic therapies revealed that listening to music may reduce the level of stress, anxiety, and pain in clients, so it is also recommended for neurological rehabilitation interventions\(^2\).

In addition, the provision of murottal Qur'an stimulation interventions can be done by listening to certain letters and verses. Some choices of verses or letters that are used can be in the form of verses that explain the motivation of life, patience through life, or other verses that can emotionally provide a therapeutic effect for the client. Murottal stimulation can also be combined with listening to the translation of the verse. Providing sequential stimulation from 1-30 juz can also be done. This makes the client more varied in listening to the verses of the Qur'an.

**Conclusion**

Based on the scientific work that the author has described above, it can be concluded that tuberculous meningitis is one of the complications of the pathological conditions of pulmonary tuberculosis, which many people experience with dense populations and less clean environments. Tuberculous meningitis results in an increase in intracranial pressure caused by inflammation that occurs in the meninges membrane. Increased intracranial pressure can then affect level of consciousness.

Loss of consciousness due to meningitis increases client’s need for special care. One of the most common clinical manifestations experienced by individuals with meningitis is severe headache. The author analyzed interventions that can be implemented to relieve the level of pain in the form of audio stimulation of murottal quran. The results of the analysis of interventions carried out for 7 days in a row found that the client experienced a decrease in pain level which also had an impact on joint mobility and increased sleep time from before. Based on this study, giving music stimulation in the form of murottal quran may be implemented in a neurological rehabilitation program.

**Recommendation**

The author hopes that the results of the analysis serve as inspiration and innovation in providing nursing care for clients with neurological disorders, especially meningitis. Modification to the intervention is required according to the characteristics of the client and family. Nurses may implement an evidence-based practice, especially in modifying audio stimulation to pain clients in a neurology ward.

The author realizes that there are many limitations in this study. Therefore, the authors hope that further research will be carried out on the analysis of the relationship of interventions to clients with neurological disorders with a larger sample population. In addition, the provision of audio stimulation as an intervention that the author did on this scientific work, can be modified to the variable according to the characteristics of the existing client.

**References**