

## Review Paper



# The Effect of Listening to the Holy Qur'an Recitation Therapy on Physiological Parameters and Neuropsychological Functions in Intensive Care Unit Patients: A Narrative Review from Physical and Rehabilitation Medicine Point of View

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## ABSTRACT

**Objectives:** This review aimed at exploring the effect of the Holy Qur'an recitation (HQR) therapy in patients admitted to intensive care unit (ICU).

**Methods:** The relevant articles in the last 10 years were reviewed to obtain data about the application of the HQR and its effects on physiological parameters and neuropsychological functions. Twenty-four articles were relevant to the topic, which consisted of 9 review articles, 14 original articles, and 1 web page.

**Results:** HQR therapy is a non-pharmacological therapy given to ICU patients to improve their physiological and psychological parameters that disturbed due to stressors in the ICU. The form of therapeutic intervention for listening to the HQR varies based on the time of administration, the length of therapy, and the chapter (Surah) read. The HQR therapy had a therapeutic effect by relieving the discomfort caused by the treatment and creating a peaceful mind. The average duration of listening to the HQR therapy is about 30 minutes, with the administration time during spontaneous breathing trials or while the patient is still on mechanical ventilation.

**Discussion:** The HQR could change the physiological parameters of the cardiovascular and respiratory systems. Listening to HQR involves religious and spiritual characteristics associated with stress, anxiety, and depression. Spirituality is related to cognitive and emotional functions such as belief, motivation, and feeling close to God, so this therapy was used to improve cognitive and psychological functions. The HQR therapy decreases the degree of pain. After receiving the HQR therapy, the psychological function is enhanced by reducing stress levels, anxiety, depression, or other emotional disorders.

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## Highlights

- The Holy Qur'an recitation therapy could alleviate cognitive and psychological dysfunction in patients in intensive care units.
- We studied when and how long the Holy Qur'an recitation therapy could give effective results.

## Plain Language Summary

We reviewed the last 10 years' published articles about how the Holy Qur'an recitation therapy has affected critically-ill patients' physiological, cognitive, and psychological functions based on the duration, starting time, and the patient's conscious level. Listening to the Holy Qur'an recitation for about 30 minutes turns out to have improved heart and lung function, decreased stress levels, and reduced patients' pain levels.

## Introduction

Improving the quality of patient care in the intensive care unit (ICU) decreases mortality. The decrease in ICU mortality is associated with an increased incidence of long-term physical, cognitive, and psychological dysfunctions known as post-intensive care syndrome [1, 2]. The ICU environment creates various stressors that cause high rates of stress, anxiety, and depression in patients during and after their admissions [3]. These stressors also caused a high prevalence of cognitive and psychological disorders [4, 5]. The weaning process and noises from equipment and staff communication with patients' families could become a stressor for critically-ill patients [6, 7].

The prevalence of cognitive impairment in ICU patients in the first year after being discharged from the ICU is about 30%-70% [4]. Patients admitted to the ICU may also develop delirium [8]. A literature review found that the incidence of delirium varies from 20% to 62%, and the duration of delirium varies between 1 and 4 days [9].

Although the delirium state is temporary, it requires special attention from ICU professionals [8]. Delirium is associated with increased mortality and duration of mechanical ventilation. Long-term complications of delirium include chronic cognitive impairment and functional disability [10]. Several factors cause delirium to develop into more severe neuropsychological disorders, including severe pain, critical illness or traumatic events, drug reactions or side effects of drug administration, high fever, metabolic disorders, dehydration, and heart failure [8]. Cognitive impairment can affect memory, executive function, and attention. These impairments cause a de-

creased ability to return to work and quality of life in patients discharged from the ICU [4].

The early rehabilitation program in treating ICU patients aims to prevent functional disorders arising from treating the main illness [1]. The benefits of early rehabilitation in the ICU include improving physical function and reducing the length of ICU and hospital stay, rate of re-hospitalization, as well as mortality 12 months after treatment [4]. One study found that 12 weeks of physical and cognitive rehabilitation improved patients' executive function [2]. In addition to early rehabilitation, several non-pharmacological treatments have been developed. Treatment with medications causes serious side effects and complications, especially difficulty in weaning from mechanical ventilation, which worsens ICU care's short- and long-term outcomes [6, 9].

Non-pharmacological treatment given to patients with psychological disorders has fewer side effects. This treatment is also safer and can be used as long-term therapy compared to medications [11]. Music-based intervention is a method that is generally accepted and used in different cultures. Relaxing music is the most commonly used type of music [12]. The Holy Qur'an recitation (HQR) therapy was also developed as a supplementary therapy for ICU patients. Muslims believe the Holy Qur'an provides calmness and relieves stress [5, 13]. Previous researchers found that HQR therapy improved physiological parameters and psychological statuses, such as stress and negative emotions [13-18]. However, how much this kind of therapy affects function in ICU patients has not been widely discussed. In addition, research data regarding listening to the HQR therapy and its effects on clinical and functional outcomes of ICU patients are still very limited and controversial. This review was written to provide an overview of the use of HQR therapy in ICU

patients. The topic of this review is the application of HQR therapy and its effects on physiological parameters and neuropsychological functions of ICU patients from the physical and rehabilitation medicine point of view.

## Materials and Methods

The relevant articles published in the last 10 years were reviewed to obtain data about the application of listening to the HQR therapy and its effects on physiological parameters and neuropsychological functions of ICU patients. Articles were collected at the beginning of January 2022 using PubMed, ScienceDirect, CINAHL, Springer Link, Research Gate, and Google Scholar databases without limiting the type of article publication. Keywords used were “Al Qur’an recitation,” “intensive care unit,” “listening to Holy Qur’an,” “Al Qur’an therapy,” “murattal,” AND “murattal therapy” for database search. Articles unavailable in full-text and English or Indonesian languages were excluded.

## Results

Twenty-four articles were relevant to the topic, which consisted of 9 review articles, 14 original articles, and 1 web page. Six, 1, and 11 articles explained the effect of listening to the HQR therapy on physiological parameters, cognitive functions, and psychological functions, respectively.

## Discussion

### The HQR therapy

The HQR therapy is a form of non-pharmacological therapy applied clinically by listening to the HQR through voice recordings or reading the Holy Qur’an live [14]. The Holy Qur’an is the holy book of Muslims. It is written in Arabic and subdivided into 114 chapters called “surah,” a word used within the Qur’an to designate revelatory passages of an unspecified length. It is believed to have a healing effect, so it was developed as a supplemental therapy for managing various diseases [19, 20].

### The rationale of the HQR therapy for ICU patients

The weaning from the mechanical ventilation process creates anxiety. It causes an increase in stress which in turn causes an increase in heart rate, respiratory rate, or other physiological parameters such as oxygen saturation (SpO<sub>2</sub>), indicating signs of weaning failure [6]. Noise in the ICU environment contributes to increased stress.

Sources of noise in the ICU include device alarms, conversations between staff, and the entry of new patients [6, 7].

Pharmacological therapy, such as analgesics and sedatives, are widely used to control stress in ICU patients. Medicines are expensive and cause many complications, including decreased respiratory functions and death. Several studies have found that continuous or high-dose sedatives result in difficulty weaning from mechanical ventilation, increased risk of pneumonia, decreased muscle strength, and increased duration or patient care costs [5, 6, 18]. Currently, non-pharmacological therapies in music therapy and listening to the HQR are being developed as supplemental therapies for treating patients and dealing with side effects due to the use of medications. Both treatments cause physiological effects such as eliminating negative emotions and increasing the stress threshold, regulating internal processes, creating a calm state, and increasing immune system function and the integrity of an individual’s psychosocial and emotional functions during treatment [5,13, 18].

The quality of evidence that supports the effectiveness of a single or combination of non-pharmacological therapies in reducing the duration and incidence of delirium in ICU patients was low or very low [9]. An increase in sedative dose was associated with an increase in delirium severity. The ability to cope with stress is an important factor that should be assessed during delirium assessment. Patients with high religious traits had a shorter duration of mechanical ventilation and ICU or hospital stays and lower delirium scores than those with low religious characteristics [10]. The HQR therapy is easy to apply, inexpensive, non-invasive, and safe. Listening to the HQR also required fewer human resources [7, 21].

### Physiological effects of the HQR therapy

Listening to the HQR results in the release of endorphins through the stimulation of alpha waves in the brain so that it can increase the stress threshold, eliminate negative emotions, and create a sensation of calm [13, 14]. Listening to the HQR can also improve the effect of noise on physiological parameters immediately after listening and over time [7]. Other studies exploring the impact of Christian religious music, such as Gregorian chanting and contemporary Christian, as well as voices of HQR, found that listening to this sacred music is associated with reduced anxiety about death and affects life satisfaction, self-confidence, and control over life. Religion is a socio-emotional resource, and listening to music is an important part of religious life [14, 15].

Understanding the Holy Qur'an is believed to affect physiological and psychological changes after receiving listening to the HQR therapy. Several studies found that this therapy could also improve physiological and psychological parameters even though it is applied to patients who do not understand Arabic. This outcome is because the content, tone, and rhythm of the HQR are pleasant to hear [16, 17].

The recitation of the Qur'an creates sound waves with a certain frequency and wavelength. This type of wave produces oscillating strands that affect the brain cells and restore their balance and harmony, thereby increasing the body's defenses against disease. This effect is the basis for using the recitation of the Holy Qur'an to cure physical and mental illnesses in patients [18].

### Intervention form and duration of the HQR therapy in ICU patients

Holy Quran recitation therapy can be used for conscious patients, who do not have delirium or hearing loss, are hemodynamically stable, and are on long-term mechanical ventilation (more than 4 days) during spontaneous breathing trials [6]. Mansouri et al. provided the HQR therapy for patients with a Glasgow Coma Scale (GCS) score of 8-10, who did not receive continuous intravenous sedative drugs, had not been hospitalized for more than 1 month, and had no history of brain damage. Patients also did not have diabetes, had no history of cardiovascular disease and fat embolism, drug dependence, otitis, and a history of skull base fracture, bleeding, or surgery in the temporal region as well as showed signs of hemodynamic stability before listening to the HQR therapy [21].

There was no standard protocol for HQR therapy [5, 6, 13, 22]. Yadak et al. provided the HQR therapy during the spontaneous breathing trial. The patients were given a session to listen to the recorded HQR (Surah Al Baqarah) for 30 minutes [22]. Elcokany and Abd El Wareth provided recorded HQR (Surah Al Fatihah and Al Baqarah) through headphones for 30 minutes for 3 consecutive days [6]. These two studies compared listening to the HQR to a control group that was only given sham headphones to reduce environmental noise [6, 22].

Another study provided a therapeutic intervention of listening to the HQR for 20 minutes, comparing Surah Ar Rahman with relaxation music to affect stress and cortisol levels [13]. Listening to Surah Al Fatihah and Surah Yasin through headphones for 30 minutes was also applied in another study to determine physiological

stress among mechanically ventilated patients [5]. Ariff et al. found no effect of listening to Surah Yasin as an adjunct to standard hemodynamic care. This result is due to the lack of research subjects because their research was carried out in the late stages of the disease. In addition, the patient's family's anxiety causes them to try to communicate with the patient so that it can cover the therapeutic effect of listening to the Qur'an [23].

HQR therapy has a physiological effect similar to music therapy. It is stated that music-based interventions can improve symptoms of discomfort and gain reassurance in the ICU. Many different types of music are used for this purpose, but a 20-30 minute session of listening to music showed the best improvement in symptoms [12]. Another study provided music therapy for 20 minutes for 3 consecutive days in addition to standard care to reduce anxiety and stabilize physiological parameters in ICU patients [24].

### The effect of the HQR therapy on physiological parameters

Yadak et al. provided an intervention in the form of listening to the voices of people reciting the Holy Qur'an for 30 minutes while weaning from mechanical ventilation or spontaneous breathing trials compared to controls who were given instructions to close their eyes for 30 minutes while using headphones. This study assessed changes in physiological parameters such as systolic and diastolic blood pressure, mean arterial pressure (MAP), heart rate, respiratory rate, oxygen saturation (SpO<sub>2</sub>), and end-tidal volume. In this study, there were no changes in physiological parameters between the intervention and control groups because the noise level of the ICU where their study was conducted was high. The noise increases stress which can affect the body's ability to heal. An open circuit created additional noise that affected the ability to listen to the HQR [22]. El-Hady et al. also found noise caused by worsening physiological parameters such as increased blood pressure and heart rate. In their study, patients in the control group only rested quietly for 60 minutes without covering their ears [7]. Another study found that noise elimination by placing the patient in a quiet room with their eyes closed could reduce the influence of the environment on the deterioration of physiological parameters [5]. It is also said that 30 minutes in the study of Yadak et al. was insufficient because critically-ill patients need a longer time to recover, be free from sedation, and be calm or ready for weaning [22].

Elcokany and Abd El Wareth conducted a study to evaluate the effect of listening to the HQR therapy on the clinical outcomes of patients undergoing weaning from mechanical ventilation. This study found significant differences in heart rate, MAP, and SpO<sub>2</sub> after the intervention between the intervention group given the HQR therapy and the control group given noise-free headphones. This effect was thought to be due to the sound of reciting the Holy Qur'an leading to spiritual relaxation and reducing the stress generated during the weaning process [6]. Other studies have also indicated that listening to the HQR improves respiratory function in patients with mechanical ventilation [7].

Mansouri et al. found that the mean vital signs (heart rate, blood pressure, and respiratory rate) decreased after the intervention in patients listening to the HQR therapy. This study also showed that SpO<sub>2</sub> increased after the intervention. There were no relationships between age, sex, and marital status with vital signs and SpO<sub>2</sub> after the intervention. Reciting the Holy Qur'an affected vital signs and SpO<sub>2</sub> but was not related to the level of understanding of the meaning of the Holy Qur'an [21].

A systematic review by Mat-Nor et al. found that auditory stimulation had a beneficial effect in increasing the level of consciousness in comatose patients [16]. El-Hady et al. also showed that the Qur'an recitation positively affected the level of consciousness and pupil size or response to light [7]. Since hearing is the most powerful sensation among other sensory aspects in comatose patients, reciting the Holy Qur'an could be given to fulfill the spiritual needs of Muslim patients [16].

### The effect of the HQR therapy on cognitive function

Research on the therapeutic effect of listening to the HQR on cognitive function is still few. One study found that patients with reduced consciousness had more pain than fully conscious patients. The degree of pain was related to the cortisol level, a pain biomarker in patients with decreased consciousness. Listening to the HQR was associated with a decrease in the degree of pain [17].

### The effect of the HQR therapy on psychological function

Elcokany and Abd El Wareth found that average anxiety scores decreased significantly after receiving the HQR therapy. The outcome was related to the spiritual relaxation that occurred due to the sound waves of the Holy Qur'an. Elcokany and Abd El Wareth's research obtained the same results as the previous studies. They

found a positive effect of the HQR on reducing anxiety in various clinical situations, including ICU care [6]. Religious traits and spirituality were associated with anxiety, depression, and post-traumatic stress disorder PTSD [10]. Spirituality involves the patient's cognitive and emotional functions, such as belief, motivation, and feeling close to God. Mental and emotional status is divided into a positive status which includes faith and belief in God, and negative status consists of the belief that God is judgmental or unfair and anxiety about death [11]. Failure to meet the spiritual needs of patients could increase the cost of patient care, especially at the end of life [10, 25].

Bashar et al. conducted a study to find out how the spiritual health of Muslim patients in the ICU affected levels of anxiety and depression, quality of life, ICU memory, health status, PTSD symptoms, and the quality of communication between patients and doctors or nurses. This study found no direct or indirect correlation between spiritual health and anxiety and depression. Religious insight was associated with a decrease in depression scale; spiritual health had a direct relationship with PTSD, and there was no association between spiritual health and other parameters studied [25].

The nature of religion and spirituality is defined as the thoughts, feelings, behaviors, and experiences that result from the search for holiness. Religion and spirituality are related to mental and physical health, which affects coping abilities and medical outcomes. This trait could also influence medical decisions and patient adherence to treatment [25].

The spiritual needs of Muslim patients can be met by praying and listening to the HQR [25]. Mat-Nor et al. confirmed that the HQR reduced the intensity of stress, anxiety, and depression. The relaxing effect after listening to the Qur'an could be caused by the sound of the Holy Qur'an being recited with a melody similar to listening to music [16]. Music therapy was empirically proven to be an effective adjunct therapy in critically-ill patients [26].

Saleem and Saleem, in their research, looked for the efficacy of listening to Surah Ar Rahman compared to relaxation music in reducing stress levels. Their study also assessed cortisol levels and the depression, anxiety, and stress scale score of the stress subscale. This study found improved stress scale scores and decreased cortisol levels after the intervention [13].

Data on the effect of listening to the HQR on cortisol levels are still very limited. Music affects health through neurochemical changes. Decreased stress levels occur after listening to music, including Islamic music, reduced cortisol or the biomedical marker of stress. The reduced cortisol levels after listening to music in ICU patients reflect the effect of relieving stress and the need for sedatives to achieve shallow sedation. Saleem and Saleem's research also found that listening to Surah Ar Rahman had a better relaxation effect than relaxing music [13].

Rustam et al. found that the comfort level of Muslim patients who were mechanically ventilated increased significantly after receiving comfort-improving treatment and listening to the HQR for 3 days [27]. The Holy Qur'an must be recited in a rhythmic, clear tone and with correct recitation. The recitation must also be done well and comfortably so the listeners can feel a more pleasant stimulus [5].

Listening to the HQR causes a significant relaxing effect. This condition may be due to the special influence of the Holy Qur'an on heart function, which causes changes in several hormones and chemical compounds that have a relaxing effect [28]. It is also stated that when listening to the recitation of the Holy Qur'an, the sound waves generated cause the heart rate to become calmer because these waves will change the negative affective of a person [29].

Related to changes in brain activity, Irfan et al., in their research, found that listening to the HQR activated a higher amplitude of alpha waves than beta waves. Alpha waves reflect a state of full awareness and serenity. The recitation of the Holy Qur'an caused the emotional transformation from negative emotions into positive ones that describe peace and happiness. Classical music also increased the amplitude of the alpha waves but not as much as listening to the recitation of the Holy Qur'an [26].

## Conclusion

HQR therapy is a non-pharmacological therapy given to ICU patients to improve physiological and psychological parameters disturbed due to stressors obtained in the ICU. The form of therapeutic intervention for listening to the HQR varies based on the time of administration, the length of therapy, and which Surah read. The Holy Qur'an therapy had a therapeutic effect similar to music therapy and could improve discomfort caused by treatment. It also creates a peaceful mind. The average duration of the HQR therapy is about 30 minutes to administer during spontaneous breathing trials or while the patient is still on mechanical ventilation.

Listening to the HQR therapy results in changes in physiological parameters such as systolic and diastolic blood pressure, MAP, heart rate, respiratory rate, and oxygen saturation which were worsened due to various stressors in the ICU. Listening to HQR therapy involves religious and spiritual characteristics associated with stress, anxiety, and depression. Spirituality is related to cognitive and emotional functions, such as belief, motivation, and feeling close to God, so this therapy was used to improve cognitive and psychological functions. The effect of the HQR therapy on cognitive function in patients with decreased consciousness was a decrease in pain. The psychological function improves after receiving the HQR therapy. Psychological function improvement is in the form of reducing stress levels due to increased cortisol levels and decreasing the incidence of anxiety and depression, and other emotional disorders.

## Ethical Considerations

### Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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### Conflict of interest

The author declared no conflict of interest.

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