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## Improving Hemodynamic Status of COVID-19 Patients with Murottal Therapy

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### Abstract

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**BACKGROUND:** COVID-19 is a respiratory tract infection caused by the coronavirus. Some patients with severe symptoms require hospital treatment needing oxygen support. The COVID-19 condition affects the hemodynamic status of the patient.

**AIM:** This study aimed to analyze the effect of murottal surah Ar-Rahman therapy on the hemodynamic status of COVID-19 patients in A. Yani Islamic Hospital Surabaya.

**METHODS:** This research design was a quasi-experiment with pre-test–post-test one group design without a control group. The population was the confirmed positive patient for COVID-19 who were treated in the Mina Room of A. Yani Islamic Hospital Surabaya from November 2020 to January 2021 with a total of 63 patients. The sample was 55 patients which were taken by purposive sampling. The variables in this study were the hemodynamic status, including blood pressure, respiration rate, heart rate, and oxygen saturation that were given murottal therapy Surah Ar-Rahman. Data were analyzed using Paired t-test and those that were not normally distributed by sign-test.

**RESULTS:** The results of this study found that there were differences in the pre-post variables of systolic blood pressure ( $p = 0.000$ ), heart rate ( $p = 0.000$ ), respiration rate ( $p = 0.000$ ), and oxygen saturation ( $p = 0.000$ ). There was no difference in the diastolic blood pressure variable ( $p = 0.263$ ).

**CONCLUSIONS:** This study concluded that the Surah Ar-Rahman therapy murottal can be used and effective to improve hemodynamic status in conjunction with therapy from the medical team. This therapy is also very easy to use anywhere.

## Introduction

At the beginning of 2020, a respiratory disease pandemic, namely, COVID-19, was caused by a new variant of the SARS-CoV2 or 2019-nCoV virus. This virus has spread rapidly to various parts of the world which greatly affects public health and the world economy. The new virus still has a close relationship with the previous virus, namely, SAR-CoV, but is more aggressive than the SAR, MERS or influenza viruses [1]. Most of the people who acquired COVID-19 had mild or asymptomatic, around 14% had severe illness requiring hospital treatment and require oxygen support, and 5% need to be admitted to the intensive care unit. The COVID-19 condition can worsen into acute respiratory distress syndrome (ARDS), sepsis to septic shock, and multi-organ failure, including kidney failure and acute heart failure [2].

Within 2.5 months, this outbreak has spread to more than 200 countries, areas, and territories around the world, and almost all countries had reported local transmission. Preventing high mortality for severe cases requiring referral healthcare services through

quality health services and health facilities is the next stage, it is estimated that 4% of cases require critical health services (critical care) [1].

Based on the initial data collection, RSI A Yani Surabaya is one of the hospitals that care for patients COVID-19 with moderate-to-severe symptoms with a total of bed capacity as many as 18 beds. Until now, the bed capacity is always full. Several patients who were treated in the room often complained to the nurse about their concerns about being diagnosed with COVID-19 and feeling uncomfortable due to regulations that did not allow their families to attend.

Many non-pharmacological therapies performed by nurses to patients synergize with medical therapy. Murottal therapy is one of easiest and most efficient therapies to do in the room for every patient [3].

The previous research has shown that giving murottal Al-Qur'an Surah Ar-Rahman for 20 min to babies with low birth weight using CPAP mechanical ventilation aids has a significant effect on heart rate, respiration, and oxygen saturation in the NICU room [4]. Another study also stated that the therapy of

reciting the Qur'an and deep breathing exercises was effective for 20 min in 4 days to improve vital signs (oxygen saturation) and anxiety levels in patients with congestive heart failure [5].

The study results were in line with prior research, which found that Al-Qur'an murottal therapy had a significant effect on the awareness and hemodynamics of head injury patients. Al-Qur'an murottal therapy is one of the non-pharmacological nursing interventions that are carried out and are expected impact on the patient's recovery and healing [6].

Al-Qur'an is a non-pharmacological therapy that has a treatment program for various disorders of the body's cells. Listening to murottal Al-Qur'an can have an effect on emotional intelligence, (EQ) intellectual intelligence (IQ) and spiritual intelligence (SQ). The activity of listening to the Al-Qur'an can cause a person to feel calm and relaxed so that it has an effect on lowering blood pressure [7].

To date, the authors have not found any previous research on the therapeutic effects of murottal Al-Qur'an on COVID-19 patients. Since a long-time until now, many complementary therapies have been developed that support treatment for patients, especially COVID-19 patients. Many therapies have been developed, one of which is murottal Al-Qur'an therapy. Many surah in the Al-Qur'an are heard in murottal therapy, including Maryam's letter which is widely studied for pregnant women and Ar-Rahmah which is widely used for patients with heart failure, kidney failure, and unconscious head injury patients.

Based on the description above, it is necessary for nurses to carry out such therapy to assist patients in improving the hemodynamic status of COVID-19 patients. In this study, researchers focused on murottal Al-Quran therapy using the surah Ar-Rahman which played to patients who were being treated at R. Mina RSI A Yani Surabaya using headphones.

## Methods

This study used a quasi-experimental with a pre-test-post-test one group design without a control group. The subject group was observed hemodynamic status, namely, heart rate (HR), respiration rate (RR), blood pressure, and oxygen saturation before and after the Surat Ar-Rahman murottal therapy intervention.

The sampling technique was purposive sampling. The inclusion criteria included: Muslim, no hearing loss, GCS 456, and willing to sign informed-consent. The exclusion criteria were patients with RR>

24×/min (shortness of breath), patients with decreased oxygen saturation (<95%), and patients with decreased consciousness. The drop-out criteria were patients who suddenly experienced an emergency or decreased which requires immediate medical attention.

The population in this study was the patient confirmed positive for COVID-19 who was treated at R.Mina RSI A Yani during 3 months from November 2020 to January 2021 a total of 63 patients.

Based on the Slovin formula, it was found that the number of samples was 55 patients. The hemodynamic status (heart rate, respiration rate, blood pressure, and oxygen saturation) was measured before and after listening to Surah Ar-Rahman's murottal therapy for 16 min using headphone.

In this study using the surah Ar-Rahman, because there is a very extraordinary wisdom for mankind in general and for Muslims in particular and provides enjoyment, comfort, and peace of mind in terms of the meaning of the surah which invites people to always be grateful for all the blessings of Allah.

The study results on heart rate and upper blood pressure which were normally distributed were analyzed using the Paired t-test. The results of respiration rate, lower blood pressure, and oxygen saturation which were not normally distributed were analyzed using a non-parametric test, namely, the sign test.

This research obtained an ethical statement from the Health Research Ethics Commission, Nahdlatul Ulama University Surabaya No. 018/EC/KEPK/UNUSA/2021.

## Results

The Table 1 shows the results of data on age, gender, length of treatment, occupation, and

**Table 1: Characteristics of respondents by age, gender, day of care, and occupation (n = 55)**

Characteristics	Frequency	Percent
Age (years) (Mean ± SD)	55.71 ± 12.53	100
Gender		
Male	24	43.6
Female	31	56.4
Length of treatment (day)		
2	24	43.7
3	19	34.6
4	6	10.9
5	1	1.8
6	1	1.8
8	1	1.8
11	1	1.8
12	1	1.8
19	1	1.8
Profession		
Civil servant	2	3
Private employees	15	27.3
Entrepreneur	12	21.8
Etc.	4	7.3
Retired	2	3.6
Does not work	20	36.4



hemodynamic status of respondents before and after being given murottal Al-Qur'an therapy.

Table 1 shows that the average age of the respondents = 55.71 with a standard deviation of 12.53. Most respondents (67.27%) are over 50 years old. The majority (56.4%) of COVID-19 patients are female. Almost half (43.7%) of the patients were in the 2<sup>nd</sup> day of treatment. Almost half (36.4%) of the patients did not work.

Table 2 shows that there are differences in the values of upper blood pressure ( $p = 0.002$ ), pulse ( $p = 0.000$ ), RR ( $p = 0.000$ ), and oxygen saturation ( $p = 0.000$ ), after patients were given murottal Al-Qur'an therapy. There was no difference in the value of the pressure of blood under ( $p = 0.263$ ) between pre and post given therapy murottal Qur'an.

**Table 2: Characteristics of hemodynamic status of respondents before and after murottal Al-Qur'an therapy (n = 55)**

Variable	Pre (Mean ± SD)	Post (Mean ± SD)	p-value
Systolic blood pressure	134.5 ± 12.5	132.2 ± 10.4	0.002*
Diastolic blood pressure	82.9 ± 10.9	81.4 ± 8.7	0.263**
Heart rate	88.6 ± 11.6	85.1 ± 9.5	0.000*
Respiration rate	24.23 ± 3.4	22.7 ± 2.6	0.000**
Oxygen saturation	97.5 ± 0.98	98.5 ± 1.1	0.000**

\*Paired t-test, \*\*Sign test.

## Discussion

### Blood pressure in COVID-19

Research shows that in COVID-19 patients, decreased lung function can be associated with increased blood pressure. Although COVID-19 was initially known as a disease of the respiratory tract, the progression of this disease toward the blood vessels causes hemodynamic instability of the patient. This is supported by evidence that SARS-CoV2 attenuates ACE2 driven modulation of vasodilation and indirectly documented RASS activation through monitoring of plasma ( $K^+$ ) changes [8].

Diastolic pressure is related to coronary circulation. When the coronary arteries encounter atherosclerosis, it will increase the diastolic blood pressure, so that with relaxation meditation, there is no significant decrease in diastolic pressure [9].

Another research stated that the sound of the Al-Qur'an (murottal) was identical with sound wave that has a knock and certain wave, spreads in the body and then into vibrations that affect motor function of brain cells and balance it. Something that is affected by the recitation of the Qur'an, the vibration of the neurons will stabilize again. Al-Qur'an contains several aspects that affect health, including, elements of meditation, autosuggestion, and relaxation [10].

Music therapy, one of which is murottal Al-Qur'an, has a therapeutic effect on the human mind

and body. The sound effects produced can affect the body's physiology on the basis of activation of the sensory cortex with secondary activity deeper in the neocortex and successively entering the limbic system, hypothalamus, and autonomic nervous system. The vestibulocochlear nerve (cranial nerve VIII) carries sound impulses through the ear to be transmitted to the brain and then to the vagus nerve (cranial nerve X) which regulates the regulation of heart rate and respiration. Sound therapists say that the vagus nerve and the limbic system are the link between the ear, the brain, and the autonomic system. This is what explains how sound can work to heal a person's physical and emotional disorders [11].

All COVID-19 patients treated in the Mina room had an average blood pressure above 120/80 mmHg and below 140/90 mmHg. After being given murottal Al-Qur'an therapy, almost all patients experienced a decrease, although not below 120/80 mmHg.

The relaxation element caused by listening to murottal Al-Qur'an therapy makes autonomic nervous stimulation controlled, enhance the epinephrine and norepinephrine secretion which inhibit the formation of angiotensin and lower blood pressure [12].

### Heart rate in COVID-19 patients

In cohort study of COVID-19 patients in the UK, it was stated that many patients had tachypnea and required additional oxygen. On average, these patients experienced a small increase in heart rate [13].

Research conducted by Mukhlis (2020) stated that there was a significant difference between the pulse and respiration of LBW infants before and after giving murottal therapy [14].

Another study stated that the sound of the Al-Qur'an was effective in increasing the patient's physiological index (blood pressure, heart rate, and respiration), the patient's level of consciousness, as well as the index of critical changes in patients in the ICU [15].

According to Wahyudi (2012) in Pratiwi (2015), murottal Al-Qur'an therapy can be used as a pain healer. It had been proven and carried out by people who read the Qur'an or listen to it experiencing changes in electric current in the muscles, in heart rate and blood pressure, and in blood levels in the skin [16].

The hospitalized patients with a COVID-19 diagnosis were not accompanied by their family. They were placed in one room with other patients with the same diagnosis. Nurses also not accompany the patient 24 h. The nurses enter the room only to provide medical therapy. One of the communication tools brought by patients is a smartphone to keep in touch with family or nurses outside the room that is bordered by glass.

Murottal Al-Qur'an therapy serves as a support for the patient's recovery, because it can create

relaxation. Stimulation of sound increases the release of endorphins, slows, and balances brain waves, thereby affecting respiratory rhythm, heart rate, and blood pressure [17].

### **Respiration rate in COVID-19 patients**

In other studies, findings showed that there were a statistically significant differences between the studied groups regarding heart rate, mean arterial pressure, respiration rate, and SpO<sub>2</sub> after intervention. This may be due to the effect of Quran sounds which lead to spiritual relaxation and reducing stress imposed by weaning process and improving physiological parameters of the body [18].

Muslims believe that the sound of reciting the Al Qur'an is beneficial in recovering from illness, improving health and having a relaxing effect, even though they do not know the meaning of the verse being listened to or recited. When the Al-Qur'an is recited in a beautiful voice, it can reduce stress, increase comfort. It can also synchronize body rhythms including breathing and heart rate affect the listener's emotions [19].

Being diagnosed with COVID-19, which requires the patient to be treated alone in the hospital, will cause concern for the patient, so that one of the psychological impacts and also one of the signs of COVID-19 disease is feeling short of breath. The murottal Al-Qur'an therapy ease the patient and impacted on breathing.

### **Oxygen saturation in COVID-19 patients**

The clinical characteristics of COVID-19 patients related to the severity of the disease have been identified, namely, low oxygen saturation which will affect the degree of disease severity and disease progression in patients [20]. During the COVID-19 pandemic, low oxygen saturation without symptoms became a common thing for COVID-19 patients [21].

Mansouri *et al.* (2017) investigated the effect of the sound of the Qur'an on blood pressure, pulse, respiration, and O<sub>2</sub> saturation in patients admitted to the ICU. Changes in physiological responses in hospitalized patients occur due to increased metabolism resulting in an increase in body temperature, cardiac output followed by an increase in blood pressure and heart rate. The results showed that after the reading of the Qur'an was heard, there were a decrease in systolic and diastolic blood pressure, mean arterial pressure, heart rate, and respiration and an increase in the percentage of O<sub>2</sub> saturation in patients [22].

Intervention of reciting the Al-Qur'an will increase the need for oxygenation. In the study, it was explained that patients suffering from heart disease showed an improvement in heart function after listening to the sound of the Qur'an. Monitoring blood pressure and heart rate by

nurses are the key to maintaining good blood circulation in patients. The need for good oxygenation will increase oxygen saturation [5], [23], [24], [25].

## **Conclusions**

Based on the research that has been done, it can be concluded that the provision of murottal Al-Qur'an therapy in surah Ar-Rahman has an effect on blood pressure, pulse, respiration, and oxygen saturation.

## **Acknowledgments**

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