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ORIGINAL RESEARCH

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THE EFFECT OF LISTENING TO MUROTTAL QUR'AN ON THE OXYGEN SATURATION LEVEL IN PRETERM INFANTS IN THE NEONATAL INTENSIVE CARE UNIT

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Abstract

Background: Preterm infants are at risk for respiratory and hypothermia disorders that may affect physiologic growth and development processes that can be aggravated by treatment processes while in the neonatal intensive care unit. Treatment in the NICU can trigger stress that can affect the vital signs and healing process of preterm infants, thus requiring non-medical treatment to stimulate the condition. This research provides a different treatment of sound therapy that has never been given to preterm infants in previous studies by listening murottal Al-Qur'an.

Objective: To examine the effect of listening to the murottal Qur'an on oxygen saturation in preterm infants during treatment at the neonatal intensive care unit (NICU).

Method: This was a pre-experimental study with one group pretest-posttest design from September to October 2017. The samples were 30 preterm infants treated at NICU of the General Hospital of Panembahan Senopati Bantul selected using accidental sampling. The analysis used was simple linear regression.

Result: There was an increase of the oxygen saturation level after given intervention of Murottal Qur'an for 3 days. The first day of oxygen saturation intervention increased by 2.07%, the second day 3.75%, and the third day 4.65% compared to the oxygen saturation level before the intervention.

Conclusion: Listening to murrotal Qur'an could statistically increase oxygen saturation, but clinically there was no significant change in preterm infants, as the increase of oxygen saturation level was still within normal limits.

Keywords: preterm infants; murottal Qur'an; oxygen saturation

INTRODUCTION

Preterm infants are at risk of developing health problems early in life due to immature organs in the body. According to the WHO (World Health Organization) report in 2015, estimated 15 million babies are born prematurely and continue to increase each year ([World Health Organization, 2015](https://www.who.int/news-room/fact-sheets/detail/low-birth-weight)). While based on the health service data, Bantul Regency

Yogyakarta was ranked the second highest case of LBW due to preterm delivery which is about 534 babies from 13.419 live births (3.98%), the need for further treatment in an effort to reduce morbidity and mortality rates ([Risksedas, 2013](https://risikesdas.gub.go.id/)). Premature infant care is intensively implemented at the NICU to provide relief for breathing, regulating of body

temperature, monitoring of vital signs and preventing from infection. Treatment in the NICU can cause stress in preterm infants due to noise caused by the sound of monitors and other aids, medical acts that hurt infants (infusion) ([Bredemeyer, Reid, Polverino, & Wocadlo, 2008](#); [Pineda et al., 2017](#)). Preterm infants with this condition are more susceptible to a physiological decline in health that can be seen in vital signs, slow healing process and may affect preterm infants growth ([Hockenberry, Wilson, & Rodgers, 2016](#); [Marcdante & Kliegman, 2014](#)). Special treatment to reduce the problems caused during treatment at NICU is necessary.

Developed and developing countries have used many sound therapeutic methods as safe, effective and efficient interventions in developing the sensory and motor nervous systems of children from birth to birth ([Alipour, Eskandari, Hossaini, & Sangi, 2013](#); [Standley, 2002](#)). Listening to murottal Qur'an is one of the sound therapies affecting the brain and stimulates alpha waves to reduce stress, reduce negative emotions, create relaxation, stabilize vital signs and boost the immune system ([Abdurrochman, Wulandari, & Fatimah, 2007](#); [Vaghefi, Nasrabadi, Golpayegani, Mohammadi, & Gharibzadeh, 2015](#)).

Management of preterm infant care in Indonesia is still largely focused on treating only physical health conditions and ignoring the psychological care of premature babies. This research is to provide new treatment innovations for premature infants at the NICU by examining the effect of murottal Qur'an toward the oxygen saturation on preterm infants treated at the NICU. Findings of this study is expected to be one of the new methods of treating premature infants in Indonesia, especially in Yogyakarta province.

METHODS

Study design

This was a pre-experimental study with one group pretest-posttest design.

Sample

The technique of determining the samples was accidental sampling and 30 participants of preterm infants were selected at NICU of RSUD Panembahan Senopati Bantul Yogyakarta Indonesia during September-October 2017. The inclusion criteria were premature infants with Islamic religion and his/her families agreed to be respondents, mothers with 29 to 37 weeks' gestational age, the age of preterm infants 0-28 days, and not using breathing aids or other assistive devices. The exclusion criteria of premature infants were those with pulmonary problems and respiratory function, congenital abnormalities, or in cases of surgery and phototherapy.

Intervention

Ar-Rahman verses 1-78 was chosen, heard with a volume of 65-75 dB or about 1000 Hz according to digital sound level meter. The distance of speaker is approximately 30 cm from the ear of the baby and heard during sleeping in the incubator. During listening to murottal Qur'an, an audiometric instrument was placed inside the incubator to measure the noise level of music to control the murottal sound of the Qur'an remained at a volume of 65-75 dB. Listening to murottal Qur'an was performed 3x15 minutes every day for 3 days in a row.

Instrument

The oxygen saturation assessment was performed using pulse oximetry placed on the feet of the infant for 1 minute with a normal range of 90% - 100%.

Data collection

The data of this research were primary data obtained from the observation and secondary data (medical record) to complete the research subject characteristic data. The oxygen saturation assessment was performed before and after given intervention.

Data analysis

Normality of the data has been tested using Shapiro-Wilk test, with the result obtained p -value $> \alpha$ (0.05), with the oxygen saturation value at the pretest (0.33), the first day (0.06),

the 2nd day (0.08) and the 3rd day (0.07), which indicated that the oxygen saturation data was normally distributed. Data were then analyzed using simple linear regression.

Ethical consideration

This study has obtained approval from the Ethics Committee of Aisyiyah University Yogyakarta (18/KEP-UNISA/VIII/2017). Informed consent in this study involved parents of premature babies.

RESULTS

Table 1 shows that the male infants tend to be dominant compared to female infants. The majority of participants aged 1-14 days, with the most dominant gestational age of 34 weeks - 36 weeks and 2000 - 2450 grams of body weight.

Table 1 Frequency distribution of characteristic of participants (n = 30)

Characteristics	Frequency	Percentage	Cumulative Percentage
Gender			
a. Male	17	56.7 %	56.7 %
b. Female	13	43.3 %	100%
Current age			
a. 1 – 14 days	26	92.7 %	92.7 %
b. 15 – 28 days	4	7.3 %	100%
Gestational age			
a 29 – 33 weeks	8	36.6%	36.6 %
b 34 – 36 weeks	22	63.4%	100 %
Current body weight			
a. 1000 – 1450 gram	2	6.6 %	6.6 %
b. 1500 – 1950 gram	7	23.3%	29.9 %
c. 2000 – 2450 gram	21	70.1%	100 %

Table 2 Simple linear regression test results of murottal Qur'an intervention influence toward oxygen saturation in preterm infants (n = 30)

Characteristics	Oxygen Saturation		
	Day 1	Day 2	Day 3
	Coef CI	Coef CI	Coef CI
Posttest	2.07 (0.67 – 3.47) *	3.75 (2.52 – 4.98) *	4.65 (3.48 – 5.82) *

Remarks: 95% confidence intervals, * p<0.05

Table 2 shows that the murottal Qur'an intervention increases oxygen saturation by 2.07% on the first day. While in the second day oxygen saturation increased by 3.75%, and 4.65% on the third day. The increase was still within normal limits. Oxygen saturation increased significantly every day during listening to murottal Al-Qur'an with p <0.05 at 95% confidence interval.

DISCUSSION

Listening to murottal Qur'an is one of the music therapies that can be done by anyone regardless of age. Findings of this study revealed that murottal Qur'an had a significant effect (95% CI, p <0.05) on the increase of oxygen saturation level during 3 days intervention, although clinically had no effect on physiological condition of premature infant.

This is in line with previous studies indicated that the use of music at the NICU has been proven to reduce stress and increased oxygen levels ([Arnon et al., 2006](#); [Bieleninik, Ghatti, & Gold, 2016](#)).

Other studies suggests that sound therapy has an optimal effect on baby's vital signs (respiratory rate, heart rhythm, oxygen saturation), drinking power and sleep quality on preterm infants which is given 3 times daily with 15 to 20 minutes duration within 3-4 days ([Jabraeili, Sabet, MustafaGharebaghi, Jafarabadi, & Arshadi, 2016](#); [Loewy, Stewart, Dassler, Telsey, & Homel, 2013](#)). The chant of Qur'an has great influence (97%) in providing calm and healing diseases ([Mahjoob, Nejati, Hosseini, & Bakhshani, 2016](#)).

Listening to murottal Qur'an can sense the great self- physiological changes, such as reduced depression, sadness, gaining serenity and resist various diseases because the voice of murottal Al-Qur'an responds by improving the rhythm of the body system ([Mirghafourvand, Shafaie, Mohammad-Alizadeh-Charandabi, & Jabbari, 2016](#); [Vaghefi et al., 2015](#)). The stimulation of listening affects the mindset that exists in the central nervous system which then diverts motor excitability in the peripheral nervous system to rebuild homeostatic processes in compensating the body system ([Dale, O'Hara, Keen, & Porges, 2011](#); [Porges, 2001](#)).

The Qur'an gives many benefits to those who read and who listen to, Allah will grant His mercy to those who listen to the Quran well compared to those who listen aside from Al-Qur'an like music ([Hussain, 2013](#)). Allah says in QS Al-A'raf verse 204 which means, "and when it is recited by the Qur'an refer carefully and watch it quietly so you can grace" ([Quran](#)). The Qur'an is as a key guideline for all Muslims in the world in behaving and thinking in everyday life.

This study has several disadvantages such as gestational characteristics (34 weeks to 36 week), which according to May and Mahimesh stated that gestational

characteristics can affect the level of maturity of the organs of the babies as well as their physiology ([May & Mahlmeister, 2014](#)). Factors that affect oxygen saturation include Hb, the level of bilirubin and oxygen levels in the blood. These factors in the study were not explored and controlled by researchers due to time constraints and costs. In addition, small sample size and absence of control group were considered as the limitation of this study. Thus, further study is needed.

CONCLUSION

The findings of this study indicated that murottal Qur'an could help stimulate and stabilize the organs of preterm infants by increasing oxygen saturation during treatment at NICU. The findings are expected to assist the healing process of preterm infants at NICU in order to reduce infant morbidity and mortality.

Declaration of Conflicting Interest

None declared.

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Author Contribution

All authors contributed equally in this study.

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