KnE Life Sciences

ICHT 2019
Selection and Peer-review under the responsibility of the ICHT Conference Committee
Volume 2019

Knowledge E
enriching | engaging | empowering

Conference Paper

The Effect of the Sound of Holy Quran on Pain Level of Neonates During Invasive Procedure

Popy Siti Aisyah[1], Yusi Sofiyah[1], and Etty Pangestuty[2]

[1]Sekolah Tinggi Ilmu Kesehatan 'Aisyiyah Bandung,Indonesia
[2]Perinatology Nurse Care Unit of Al Islam Bandung Hospital, Indonesia

Abstract

Venipuncture and intravenous therapy are painfull procedures when hospitalized. The experience of pain in the neonatal period can lead to impaired neurological, attention, and learning development and also behavioral disorders in children. One of the most pleasant types of music is the recitation of the Holy Quran is a complementary therapy for relief pain. Although Breastfeeding was effective for reducing pain but not easy to implemented if nurse or health care proffesionals need space room for intervention and far from their mother. So need study further about non pharmacological treatment contributes to optimal pain management in neonates. This study aimed to determine the effect of the sound of the holy Quran recitation on pain level neonates undergoing the invasive procedure at Perinatology Care Unit on Al Islam Hospital Bandung. This was a quasi-experimental study conducted on 36 neonates, selected with purposive sampling divided into two groups. Pain level was measured with Neonatal Infant Pain Scale instrument during venipuncture or intravenous procedure. The Study was conducted since desember 2018 until february 2019. The data were analyzed using Mann whitney. The result showed a significant difference in pain level (p= 0.001) between the intervention and the control groups. The findings indicated that the sound of Holy Quran recitation could help decrease pain level of neonates during invasive procedure.

Keywords: holy quran,acute pain, neonates

Corresponding Author:
Popy Siti Aisyah
nursepops02@gmail.com

Received: 22 September 2019
Accepted: 4 October 2019
Published: 10 October 2019

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the ICHT 2019 Conference Committee.

1. Introduction

Venipunicture for blood sampling and intravenous therapy are the most common interventions in hospitalized neonates patients [1]. These are provided acute pain experience in neonates patient. The breakdown of tissue by venipuncture or intravena catheter make begins tranduction process of pain. Neonates more sensitive to pain and have fully developed pain transmission pathways but lack fully developed inhibitory systems [2]. Evidence suggest that pain in neonates can have profound and lasting consequences and may exaggerate affective and behavioral responses during subsequent painful

events [3]. Pain management in neonates is very important to enhance their quality of life.

Pain management protocols by invasive procedure vary among neonatal intensive care unit. Some studies suggest that nonpharmalogical approaches to pain relief are more effective and side effects a little. The use of non-nutritive sucking (NNS), the administration of sucrose, breastfeeding and holding, facilitated tucking and music have good evidence for relief acute pain [4]. Breastfeeding was difficult if nurse or health care proffesionals need space room for intervention and far from their mother. The practice of NNS did make the baby confusion of nipple. So need study further about non pharmacological treatment contributes to optimal pain management in neonates.

The success of pain management in neonates depends on environment and behaviour [3]. Zhu et,al [4] proved that Combination music therapy with breastmilk feeding to relief pain during heel lance is more effective. Music therapy used approaches pleasant audio stimuli to provide physiological and psychological comfort. Some studies music therapy included classical music, lullabies, intra-uterine music, and nursery rhymes had positive effect reducing pain in neonates but the efficacy inconclusive [6]. Furthermore study about music therapy to decrease pain is necessary.

The sound of the Holy Quran or 'murattal' is one of a kind music therapy with religious approach for islam society. The Quran is the Holy book of Muslims and provide meaning for the mosleem life. Some studies showed that listening murattal Al Quran was decreased pain intensity undergoing intravenous therapy in preschool age and blood sampling from the heel in neonates [7]. The other studies had an impact to stabilize the pulse and Infant's APGAR Score in the first minute [8]. No prior studies have been focused on the effect of the sound of Holy Quran on acute pain of neonates during venipuncture and intravenous procedures.

In October 2018, the researcher was measured pain neonates during venipuncture or intravenous therapy at perinatology unit AL Islam Hospital Bandung to 13 newborns by NIPS (Neonates Infant Pain Scale). They have pain experienced with an average intensity of pain range score is 3-5. That proved the neonates has experienced moderate pain until severe pain. The nurse had given breastmilk feeding from their mother after invasive procedure, but no treatment for relief pain during procedure. The present study aimed to evaluate the effect of the sound of the Holy Quran on pain caused by venipuncture and infusion therapy of hospitalized neonates at perinatology care unit.

2. Methods

This reseach was conducted in Perinatology Care Unit AL Islam Hospital Bandung from January until February 2019. This research employed a quasi-experimental study design. Subjects were selected through purposive sampling. Neonates meeting the study criteria were recruited and divided into two groups with 18 subjects for intervention group (sound of holy Quran) and 18 subjects for control group. The intervention group was exposed infusion or venipuncture with hearing of the sound of holy quran, while the control group was exposed to when venepuncture or infusion under the normal perinatology care routine. The inclusion criteria included neonates were as follows: 1) age 0 – 28 days; 2) gestational age of ≥36 weeks; 3) normal weight; 4) healty hearing using the startle test; 5) compos mentis; 6) have islam religions; 7) physiologic response stable (normal breathing, blood pressure, pulse, temperature) and 8) take invasive prosedure such as venipuncture or infusion for the first time. The exclusion criteria were as follows: 1) neonates who were clinically unstable or whose physiological parameters were labile; 2) undergoing painful procedure before the study.

2.1. Measurement

The intensity of pain level was measured by Neonatal Infant Pain Score (NIPS). The NIPS is instrument for assesment acute pain by procedure for neonates [3]. The NIPS measured intensity of pain by facial expression, crying, breathing patterns, arm and leg movements and arousal. They category score range from 0 – 1, except cry category range from 0-2. The interpretation from instrument indicated mild pain if score range from 1-2, moderate pain if score range from 3-5 and severe pain if score range from 5-7. This instrument was translated in indonesian version with interrater reabiability is 0,92 -0,97; internal consistency with α cronbach's is 0,87-0,95 and concurrent validity with pearson correlation is 0,53-083 [9, 10].

2.2. Data collection and procedure

In the pre-intervention phase, the researcher was screening the neonates based on inclusion criteria to enroll in this study. The researcher explained the objective study to their parents before start intervention with obtaining informed consent. The demographic characteristics of the neonates were documented in document file of research

include gender, gestational age, weight, age. The researcher used video recorder to avoid bias assessment from observer.

2.3. Intervention protocol

The neonates in treatment groups and control groups get an invasive procedure, and they fed by breast milk half an hour before the intervention phase. In treatment groups, the sound of holy quran was played three minutes before venipuncture or infusion procedure. Sound of Quran from juz 30 version Muzzamil hasballah with Mp3 player. The distance Mp3 and baby bed are one meter with 65 db sound intensity [7, 11]. The researcher measured pain score by NISP and response behaviour recording by video during intervention.

In the control group, the co-researchers did venipuncture procedure or intravenous therapy of the neonates without performing nonpharmalogical interventions. The pain score were of the neonates were measured and recorded by the researcher three minutes during the intervention. Additionally, all the neonates received routine care during their hospitalization.

2.4. Data analysis

To obtain the results, the questionnaires were first numbered, and then the collected data from each group were analyzed using SPSS version 13. Descriptive statistics were used for tabulations, absolute frequency distributions and percentage, and mean and standard deviation. Mann Whitney was used for analysis of the differences from intervention groups and control groups.

3. Results

In the treatment group, 67 % of the neonates were male, and 34% were female. In the control group, 56 % of neonates were male and 44 % were female. The study sample is homogenous in terms of gestational age, weight and gestational age between treatment and control groups (Table.1).

According to the results of repeated measured frequency of pain in the treatment group, the group had 83,3 % mild pain, 11,1 % moderate pain and 5,6 % severe pain. In the control groups had 77,8 % severe pain and 22,2 % moderate pain. There is demonstrated that intensity of pain in holy Quran groups was significantly lower score NISP than the

Table 1: Characteristic neonates of This Study.

	Intervention	Control	P value
Age (day)	4.8 ± 1.3	4.7±1.2	0.85
Birth weight (gram)	3176.8±278.2	3150±248.9	0.60
Current weight (gram)	3033.4±267.9	3015±236,1	0.47
Gestational age (week)	37.8 ± 1.2	37.4 ± 1.3	0.80
Type delivery Spontanous	14	11	0.67
Caesaria	4	5	
Vacuum Extraction	0	2	
Gender Male	12	10	0.80
Female	6	8	

control group, with mean and standard deviation 1 ± 1,49 in the treatment groups and 6 ± 0.98 in the control groups. Based on shapiro wilk test the both of groups had p < 0,05. According to the results of mann witney test and based on the NIPS standard, the mean pain intensity had significant difference between the intervention and control groups during blood sampling and intravenous therapy (P <0.05) (Table.2). The result of a study regarding that the sound of Holy Quran have benefit to relief pain on nenates during invasive procedure.

Table 2: Mean of Pain Intensity Based on Neonatal Infant Pain Scale (NIPS) Scale in Intervention and Control Groups.

Group	N	Max	Mean	Min	SD	P value
Control	18	6	6	3	0,98	0,001
Intervention	18	5	1	0	1,49	

4. Discussion

In the present study, there were no significant differences between gender, age, weight, gestational age and delivery age in both of groups. In similar study showed that pain response in male neonates and female neonates were not significantly differences [5]. The experience in the past with type delivery were not association with pain response in neonates. Potter and Perry (2005) explained that the pain tolerance was influenced by biochemical factors without regard to gender classification and past pain experiences. This is consistent that pain response in the preschool age during intravenous therapy didn't correlate with the experience infusion therapy in the past [4]. In the control groups, neonates who have vacuum extraction experience was same level severe pain with neonates who spontaneous delivery experience.

Both groups showed infants who were of sufficient age and normally weight but procedural painful even more sensitive. This consistent with the result of the study that pain intensity of control groups is higher that intervention groups. Almost of neonates in control group have Score NIPS severe pain category. Neonates have a higher density of high threshold Aδ and low threshold Aβ mechanoreceptors/cm2 that respond with lower firing frequency [12]. So the process of tranduction to transmission be faster but neonates couldnt inhibition system. The immature descending pain pathway exposes preterm infants and neonates to a greater intensity of pain for a prolonged period. Painful and tactile stimuli elicit specific haemodynamic responses in the somatosensory cortex, implying conscious sensory perception in preterm neonates [12]. The sound of holy Quran could helped to inhibition transmission modulation of pain.

The results of the present study showed that leading the sound of Holy Quran undergoing invasive procedure could decrease pain intensity of neonates ($p<0,05$). Most of the treatment groups had mild pain intensity. Its sound can reduce hormones stress, active natural endorphin, distract from tension and improve physiological response like lower blood pressure, respiration rate and pulse [5, 13, 14]. The relaxation effect from Holy Quran produced by activated endorphin to inhibition pain modulation process in acute pain by invasive procedure.

The physiology of acute neonatal pain included three processses are transduction, transsmission and modulation and suprapsinal processing and perception of pain in cerebri cortex. Tranduction is local peripheral nervous system processes occurs when noxious stimuli are translated into neuronal action potential at the nociceptors, which are the sensory endings of the primary afferent neurons in the periphery. Transsmission and modulation is the propagation of action potentials along ascending pathways from the site of transduction throughout the sensory nervous system to the spinal cord, then centrally to the brain; and activation of descending pathways that exert inhibitory effects on the synaptic transmission of noxious stimuli. Supraspinal processing and integration of pain or perception of pain is the result of neural processing: Recognition, defining and responding to noxious stimuli in the brain [12]. The spinal cord is an important site for modulation of nociceptive input.

Sound wave from holy quran converted as electrical impluses by hearing process. The electrical impluse then proceed to the cerebral cortex in activated limbic system to release neurotransmitter beta endorphin. This hormone has an important role inhibiting excitatory pain. Beta endorphin could inhibition the modulation process so the response of pain were mild. The study reinforced evidence that listening of holy Quran can stimulate beta endhorpihin hormone in neonates.

The contributing factor from this study is a kind of slow tempo musical therapy. The tempo of murotal Al quran with qari Muzzamil Hasbalah is 95,99 [15]. Music with slow tempo produces a relaxation effect for listener. Chanda & Leviti [16] explain that relaxing music initiates brainstem responses cholinergis and dopaminergic neurotransmission to regulate heart rate, blood pleasure, body temperature, skin conductance, and muscle tension. This consistent with the other research that playing the sound of the Holy Quran during painful procedures could positively influence the stabilization of the physiological responses in the hospitalized neonates, increasing infant APGAR Score after birth, improving vital sign from nulliparous women, and decrease anxiety when medical procedure [5, 8, 17, 18]. Confounding factor in this research such as skill competence, restrain technique from the nurse and type of needle had used in the invasive procedure were not controllable. Badr,et al [19] explain that type of needle used, state of the infant before the procedure, and psikomotor skill of the nurse can provide bias effect for response pain of neonates. Despite the attempts of the researchers to perform one injection when undergoing venipuncture or infusion therapy to subjects.

5. Conclussion

Based on the result, create nursery room care with sound of holy quran is an alternative nonpharmalogical method to reduce pain intensity of neonates during invasive procedure. This findings provide knowledge to increase quality of nursing care in neonates. Further research should be conduct to evaluate the effectivity of treatment with large sample size and the other invasive procedure in neonates care.

References

[1] Steurer, M. A., & Berger, T. M. (2011). Infusion therapy for neonates, infants and children. *Der Anaesthesist*, *60*(1), 10-22.

[2] Carter, B. S., & Brunkhorst, J. (2017, March). Neonatal pain management. In Seminars in perinatology (Vol. 41, No. 2, pp. 111-116). WB Saunders.

[3] Witt, N., Coynor, S., Edwards, C., & Bradshaw, H. (2016). A guide to pain assessment and management in the neonate. *Current emergency and hospital medicine reports*, *4*(1), 1-10.

[4] Kusuma, H. W., Tri, H, W., & Susilaningsih, E, Z. (2018). Pengaruh terapi murotal terhadap tingkat nyeri pada anak saat pemasangan infus di RSUD DR Moewardi

Surakarta. *Electronic Theses And Disertation Universitas Muhamadiyah Surakarta. Naskah Publikasi.*

[5] Zhu, J., Hong-Gu, H., Zhou, X., Wei, H., Gao, Y., Ye, B.,... & Chan, S. W. C. (2015). Pain relief effect of breast feeding and music therapy during heel lance for healthy-term neonates in China: A randomized controlled trial. Midwifery, 31(3), 365-372.

[6] Cignacco, E., Hamers, J. P., Stoffel, L., van Lingen, R. A., Gessler, P., McDougall, J., & Nelle, M. (2007). The efficacy of non–pharmacological interventions in the management of procedural pain in preterm and term neonates: a systematic literature review. European Journal of Pain, 11(2), 139-152

[7] Marofi, M., Abedini, F., Shirazi, M., Badiei, Z., Baghersad, Z., & Nikobakht, F. (2018). Effect of the sound of the holy Quran on the physiological responses and pain caused by blood sampling from the heels of hospitalized neonates at the neonatal intensive care unit. *Iranian Journal of Neonatology IJN*, *9*(3), 57-63.

[8] Bayrami, R., & Ebrahimipour, H. (2014). Effect of the Quran sound on labor pain and other maternal and neonatal factors in nulliparous women. Journal of Research & Health Social Development & Health Promotion Research Center, 4(4), 898-902.

[9] Hidayati, I. N. (2018). Studi Deskriptif Pengetahuan dan Sikap Perawat Tentang Manajemen Nyeri Pada Neonates di Ruang Perinatologi dan PICU/NICU RSUD TUGUREJO DAN RSUD KRMT WONGSONEGORO SEMARANG (Doctoral dissertation, Universitas Muhammadiyah Semarang).

[10] Hockenberry, M. J., & Wilson, D. (2009). Essential of pediatric nursing. *St. Louis Missoury: Mosby*.

[11] Whipple J. The effect of music-reinforced nonnutritive sucking on state of preterm, low birth weight infants experiencing heel stick. J Music Ther. 2008; 45(3):227-72.

[12] Hatfield, L. A. (2014). Neonatal pain: What's age got to do with it?. *Surgical neurology international*, *5*(Suppl 13), S479.

[13] Majidipour N., Nirouzad, F., Madmoli,Y., Sarrafzade, Sh., Kalani, L., Aghababaeian H., et al. (2018) The Effect of Holy Quran Recitation on the Physiological Responses of Premature Infants during Phlebotomy: A Randomized Clinical Trial. *Int J Pediatr* 2018; 6(7): 7869-81. DOI: 10.22038/ijp.2017.24203.2038

[14] Arnon S, Shapsa A, Forman L, Regev R, Bauer S, Litmanovitz I, et al. Live music is beneficial to preterm infants in the neonatal intensive care unit environment. Birth. 2006; 33(2):131-6.

[15] Wirakhmi, I. N., Utami, T., & Purnawan, I. (2018). Comparison of Listening Mozart Music With Murotal Al Quran on the Pain of Hypertension Patients. Jurnal Keperawatan Soedirman, 13(3), 100-106.

[16] Chanda, M. L., & Levitin, D. J. (2013). The neurochemistry of music. Trends in cognitive sciences, 17(4), 179-193.

[17] Babamohamadi, H., Sotodehasl, N., Koenig, H, G., Jahani, C & Ghorbani, R. (2015). The Effect of Holy Qur'an Recitation on Anxiety in Hemodialysis Patients: A Randomized Clinical Trial. J Relig Health (2015) 54:1921–1930 DOI 10.1007/s10943-014-9997-x

[18] El-Hady, M, M & Kand, n, A. (2017). The Effect of Listening to Qur'an on Physiological Responses of Mechanically Ventilated Muslim Patients. *IOSR Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940* Volume 6, Issue 5 Ver. IX. (Sep. -Oct.2017), PP 79-87

[19] Badr, L. K., Abdallah, B., Hawari, M., Sidani, S., Kassar, M., Nakad, P., & Breidi, J. (2010). Determinants of premature infant pain responses to heel sticks. *Pediatric nursing*, *36*(3).