

EFFECT OF MUROTTAL THERAPY ON BLOOD PRESSURE OF PREGNANT WOMEN WITH HYPERTENSION

Santi Wahyuni¹, Badriah², Yanti Cahyati³

^{1 2} Program Studi Keperawatan Cirebon, ³ Prorgam Studi Keperawatan Tasikmalaya,
Poltekkes Kemenkes Tasikmalaya

Email : daffa_keisha@yahoo.com & poltekkes.tsm@gmail.com

ABSTRACT

The high incidence of cases of Hypertension in Pregnancy (HDK) increases the risk of maternal and perinatal complications, even maternal death. Complementary therapy can be done to help control blood pressure (TD), murottal therapy is one of the therapies that is conceptually believed to provide a relaxing effect that can help control TD. Murottal therapy can be done only by listening to the chanting of the verse (version A), only the translation (B), or the verse accompanied by the translation (C). These types of differences are as far as researchers know that no one has done the research. The purpose of this study was to determine the effect of murottal therapy on changes in BP of pregnant women with hypertension. Quasi-experimental research design with a pretest-posttest group approach. Obtained 27 respondents with inclusion criteria namely Muslims, TD \geq 140/90 mmHg, and willing to be respondents. The analysis showed that there were differences in systolic and diastolic BP in groups 1, 2, and 3 before and after murottal therapy versions A, B, C, and there were no significant differences between systolic and diastolic BP between the three groups. In conclusion, the three types of murottal therapy performed to have the same effect in reducing systolic and diastolic BP. This shows that any type of murottal therapy has a significant impact in reducing blood pressure. Researchers recommend the application of murottal therapy in HDK patients as an alternative effort to reduce BP.

Keywords: BP, hypertension, murottal therapy

BACKGROUND

Hypertension in pregnancy is a major cause of morbidity, long-term disability and maternal and fetal mortality. Nearly one-tenth of all maternal deaths in Africa and Asia are attributable to HDK, and a quarter of maternal deaths in Latin America are complicated (WHO, 2011). The Maternal Mortality Rate (MMR) in Indonesia in 2012 was still dominated by HDK, reaching 25%, in 2013 it reached 32%. These data indicate that HDK is a major cause of maternal death. It is estimated that 5-10% of cases of HDK, mothers experience difficulties in the delivery process and are at risk for babies with low birth weight.

The highest MMR of the 6 regional groups in West Java is in Region III Cirebon (366.80 / 100,000 KH), including Kuningan Regency (West Java Health Office, 2017). Kuningan Regency ranks the 4th highest MMR in West Java in 2017, namely 122.9 / 100,000 KH (West Java Health Office, 2017). A quarter of MMR in 2013 in Kuningan District was due to HDK (Dinkes Kuningan, 2013). The incidence of HDK in RSUD '45 Kuningan in the last six months of 2016, cases of preeclampsia 21% and gestational hypertension 11%.

The high incidence of HDK indicates a higher risk of maternal and perinatal complications. Complications can include decreased blood supply to the placenta, placental abruption and damage to internal organs (WHO, 2011). The prevention and management of complications is carried out pharmacologically and non-pharmacologically. However, the use of pharmacological therapy in pregnancy is not recommended because of the risk to the fetus and the risk of placental insufficiency. Pharmacological therapy is only given in certain conditions and is more focused on efforts to prevent morbidity such as stroke and myocardial dysfunction.

Management of HDK cases mostly applies non-pharmacological therapy because it does not cause side effects, although it requires a relatively longer time. The use of music therapy in the health sector is not only in modern times, since the time of Islamic civilization has grown rapidly. Music was

used for therapy by legendary Islamic musicians, such as Abu Yusuf Ibn Al-Kindi and Al-Farabi.

Various research results are used as evidence based in this study. Research on the application of music and murottal therapy in cases of hypertension shows the effect of therapy on reducing BP (Widayati, 2014; Kartini, 2016; Romadoni, 2013; Mulyadi, 2013; Ismarina, 2015; Supriadi, 2015). Research by Zulkurnaini, et.al. (2012) in Malaysia showed Yasin letter therapy increased brain waves compared to classical music; Abdullah, et.al. (2011) in Malaysia, murottal produces alpha waves and is calming compared to rock music; Fauzan and Abidin (2017) prove that the verse chair is applied to stimulate the brain; Wirakhmi and Purnawan (2018) in Purwokerto prove that Ar-Rahman's murottal Qur'an Surat (QS) therapy is more effective in reducing the pain of hypertensive patients compared to Mozart's music.

Murottal therapy application uses several types of letters of choice such as chair verses, Surah Yasin, Al-Rahman, Yusuf, Maryam, Al-Baqarah, An Nisaa', but to the knowledge of researchers there is no research that has conducted a review between the holy verses of the Qur'an and their translations. Murottal therapy can be done only by listening to the chanting of the holy Qur'an or verses and their translations. Listening to the recitation of the holy Qur'an has a therapeutic effect, including individuals who do not understand the meaning of the verse being read (Elkadi in Ibrahim, 2017). The Qur'an can function as sound therapy because listening to the chanting of the Qur'an can create calm (relaxation) and a state of alertness compared to classical music (Zulkurnaini, et.al., 2012).

The majority of Indonesia's population is Muslim, so reading, listening to murottal, apart from being therapy, is also part of daily worship. Even pregnant women can read and listen to the chanting of the holy Qur'an to their fetus. Apart from stimulating the growth and development of the fetus, the mother will feel closer to Allah. This provides comfort and serenity for both mother and fetus. The holy Qur'an verses that are read with good tartil and tajwid, have a frequency and wavelength that can positively affect the brain and restore balance to the body (Wahyuni, 2017).

All verses and surahs in the Al Qur'an have good content. Likewise, the letter of Maryam can be read by the mother during pregnancy. The letter Maryam describes the figure of a woman who is obedient to worship, patient when experiencing difficult times and loneliness when giving birth to Prophet Isa, and very much maintaining her chastity (Wahyuni, 2017).

Murottal therapy is believed to have a powerful relaxing effect on pregnant women. The response to relaxation techniques is thought to inhibit the autonomic nervous system and central nervous system, as well as increase parasympathetic activity which will decrease heart rate so that cardiac output decreases and ultimately BP will decrease (Rosdiana & Cahyati, 2016). Murottal therapy can be done only by listening to the chanting of the verse (version A), the translation only (B) or the verse accompanied by the translation (C). Based on the description above, the aim of this study was to determine the effect of murottal therapy on BP changes in pregnant women with hypertension.

METHOD

Quasi experimental research design. This research used three groups, each group was carried out pretest and posttest. The study population was all pregnant women who had hypertension and had their pregnancy checked at the Kuningan district health center during the study period. There were 27 respondents with Muslim criteria, BP \geq 140/90 mmHg, did not have a history of hypertension, did not take antihypertensive drugs and were willing to become respondents. 27 respondents were obtained according to the criteria that the researcher set and were divided into 3 groups.

Respondents were measured BP before the murottal therapy intervention (pretest). Respondents were given therapy guidance and taught how to do murottal therapy using portable wireless mini speakers (music box) and a 4 Gb capacity Toshiba brand MicroSDHC memory Card (MMC) containing files of murottal QS Maryam versions A, B and C. Medium tempo murottal with details of duration version A 25 minutes 19 seconds, version B 19 minutes 29 seconds

and version C 45 minutes 20 seconds.

Each respondent routinely performs murottal therapy at home (every day for 30 days and is done after sunset prayers). The intervention group 1 (R1) was given murottal therapy version A by listening to the chanting of the holy verse from QS Maryam, the intervention group 2 (R2) used version B which contained a translation of QS Maryam, and the intervention group 3 (R3) murottal version C by listening to chants and translations QS Maryam. The level of compliance of respondents in carrying out murottal therapy according to the version of the group was monitored by the researcher and assisted by the enumerator (regional coordinator midwife) by filling in a checklist. BP measurement during and after the intervention (posttest) was carried out directly at the health center every week on the fifth day for each intervention group. Respondents were also subjected to ANC examinations. For respondents who were unable to attend the puskesmas, a home visit was conducted. Each TD measurement result is documented in the blood pressure monitoring form.

The results of the normality test using the Shapiro-Wilk test showed that the data were not normally distributed. Univariate data analysis to determine the median value and the Interval Quartile Range (IQR) of BP before and after the intervention in each group. Furthermore, bivariate analysis was carried out to see systolic and diastolic BP between groups using a non-parametric test (Kruskal-Wallis H test). This study has received ethical approval from the Health Research Ethics Commission (KEPK) of the Tasikmalaya Poltekkes no. 2018 / KEPK / PE / VII / 0004. Research respondents had informed consent, their identity was written in the respondent's code (anonymity), and the confidentiality of the research results was guaranteed (confidentiality).

RESULT

The results of univariate data analysis in the form of respondent characteristics and BP measurement results before and after intervention are described as follows:

Table 1.Frequency Distribution based on Respondent Characteristics (n = 27)

Characteristic		R1		R2		R3	
		n	%	n	%	n	%
Age	Low Risk	6	66,7	8	88,9	6	66,7
	High Risk	3	33,3	1	11,1	3	33,3
Paritas Status	Primipara	1	11,1	1	11,1	1	11,1
	Multipara	5	55,6	6	66,7	8	88,9
	Grandemultipara	3	33,3	2	22,2	0	0
Gestation Age	Trimester I	1	11,1	1	11,1	2	22,2
	Trimester II	6	66,7	4	44,4	6	66,7
	Trimester III	2	22,2	4	44,4	1	11,1

The majority of respondents in the three groups were at low risk age and were dominated by multiparity parity with the second trimester of gestation. There were 22.2% in R2 and 11.1% in R3 who took hypertension drugs. BP before and after the intervention is presented in the following table:

Table 2. Pre and Post TD performed Murottal Therapy Versions A, B and C.

Murottal Therapy Version	Variable Blood Pressure	N	Median	IQR	SD	95% CI for mean	
						Min	Max
A	Pre systolic	9	140	10	13,229	140	180
	Post systolic	9	130	15	10,541	120	150
	Pre diastolic	9	90	10	7,265	90	110
	Post diastolic	9	90	10	6,667	80	100
B	Pre systolic	9	140	5	26,458	140	220
	Post systolic	9	140	10	18,559	110	180
	Pre diastolic	9	90	5	10,138	90	120
	Post diastolic	9	90	10	6,667	80	100
C	Pre systolic	9	140	15	8,660	140	160
	Post systolic	9	130	5	6,009	120	140
	Pre diastolic	9	100	10	9,718	90	120
	Post diastolic	9	80	10	5,270	80	90

Table 2 shows the median systolic BP in the R1 and R3 groups before intervention was 140 mmHg and after intervention 130 mmHg, R2 before and after intervention was 140 mmHg. Whereas the median diastolic BP at R1 and R2 before and after intervention was 90 mmHg, R3 before intervention was 100 mmHg and after intervention was 80 mmHg. The statistical test to determine the difference in systolic and diastolic BP before and after the intervention in each group used a non-parametric test, namely the Kruskal-Wallis H test. The results can be seen in table 3 below:

Table 3.Kruskal-Wallis H Test (h-Test) for BP Before (Pre) and After Intervention (Post)

Variable		Mean Rank			p-Value	Kruskal-Wallis H
TD	R1	R2	R3			
Pre systolic	13,89	12,72	15,39	0,694	0,732	
Post sistolic	11,89	17,61	12,50	0,205	1,522	
Pre diastolic	14,33	11,83	15,83	0,467	1,522	
Post diastolic	15,22	15,22	11,56	0,446	1,613	

Based on the table above, it can be seen that the p value of systolic and diastolic BP on the four variables of BP > 0.05, so that Ho is accepted, meaning that there is no significant difference between systolic and diastolic BP before and after the intervention between groups. In general, this murotal therapy has a significant effect in reducing systolic and diastolic blood pressure, it can be seen from the table above which shows a decrease in systolic and diastolic blood pressure in all types of murottal therapy.

Discussion

The description of the characteristics of the respondents, the majority of them are of low age (the age group between 20-35 years which is relatively safe for pregnancy / childbirth), namely the R1 66.7%, R2 88.9% and R3 66.7%. Similar to Widayati's (2014) research in Riau and Kartini (2016) in Tangerang, 70% and 53.3% of respondents were respectively aged 20-35 years. In contrast to Cunningham (2012), the risk of HDK in the form of preeclampsia is found in young mothers, while those aged > 35 years are more at risk of experiencing chronic hypertension. HDK cases in this study were mostly found in multiparous (70.37%). Puspitasari research in 2013 in Semarang, 62.8% of the respondents were multiparous. According to Cunningham (2012), 3-10% nulliparous are at risk of HDK.

Young nulligravida mothers are at greater risk of developing preeclampsia (Rozikhan, 2007). Based on gestational age, the majority of respondents were trimester II (66.7% for R1 and R3), while R2 was trimester II and III (44.4%). The results of the Kartini (2016) murottal therapy study in Tangerang, 46% of HDK cases in the second trimester and 55.3% in the third trimester. Widayati's research (2014) in Riau, the majority of respondents (73.3%) trimester III and 26.7% trimester II. An increase in systolic BP by 30 mmHg and diastolic BP by 15 mmHg experienced by mothers in the second and third trimesters (Rozikhan, 2007). Maternal age, parity status, gestational age predispose

to the incidence of HDK. The results of the medical history assessment showed that the majority of respondents did not have a history of hypertension. In contrast to Cunningham (2012), women who are normotensive in a previous pregnancy have a lower incidence of preeclampsia in subsequent pregnancies. None of the respondents in the R1 group took hypertension drugs, but a small proportion of the respondents in R2 and R3 took anti-hypertensive drugs. Anti-seizure and anti-hypertensive drugs are generally given in cases of severe preeclampsia. The provision of anti-hypertensive drugs to mothers with chronic hypertension is still debated because it can reduce BP, but a lower BP can decrease the uteroplacenta so that it has an impact on the fetus (Leveno, 2015). Anti-hypertensive administration is started if systolic / diastolic > 160/110 mmHg and MAP > 125 mmHg (Kristiyani, 2013).

The results of this study prove that murottal therapy has a relaxing effect so that it affects BP reduction. The three types of murottal therapy performed had the same effect in reducing systolic and diastolic BP. In line with the results of a review of two articles by Yuliani (2018), it is evident that the majority of respondents experienced a decrease in hypertension levels after murottal therapy. Respondents with severe hypertension became without hypertension or normal. Respondents whose hypertension became pre hypertension.

The findings of this study, before the intervention (pre) the lowest BP was 140/90 mmHg, the highest was 220/120 mmHg

while after the intervention (post) the lowest BP was 110/80 mmHg and the highest was 180/100 mmHg. This indicates a decrease in BP from before and after the murottal therapy intervention. The main clinical manifestations of HDK cases are an increase in BP reaching 140/90 mmHg or more or an increase in systolic BP reaching 30 mmHg and diastolic 15 mmHg above the baseline value (Leveno, 2015). BP can increase in pregnancy or hypertension since before pregnancy or new hypertension found before 20 weeks of gestation and a condition that persists after the pregnancy ends (American Committee and Maternal Welfare in Wagiyo, 2016).

The majority of respondents experienced a decrease in BP after being given murottal therapy. This shows the benefits of Maryam's letter murottal therapy. Murottal therapy can provide peace to pregnant women. This relaxed and calm condition will trigger the secretion of CRH (corticotropin releasing hormone) and ACTH (adrenocorticotrophic hormone) in the hypothalamus to decrease. The decrease in these two hormone secretions causes the activity of the sympathetic nerves to decrease so that adrenaline and noradrenaline expenditure decreases, as a result there is a decrease in heart rate, dilated blood vessels, reduced blood vessel resistance and decreased heart pump so that the heart arterial blood pressure decreases (Sherwood, 2011 in (Rosdiana & Cahyati), 2014)). This therapy is safe because it does not cause side effects for the mother or fetus, and in terms of low cost and easy to implement in everyday life (Widyastuti, 2015).

Based on the Kruskal-Wallis statistical test (h-Test) between groups (between groups) showed no significant difference between systolic BP before and after the three murottal versions of the intervention. This shows that reading or listening to the Holy Qur'an and its meaning or translation has the same benefit in providing a relaxing effect. Murottal is a reading of the Al-Qur'an that focuses on two things, namely the truth of the reading and the song of the Al-Quran (Hamka, 2018). Reading the holy verses of the Qur'an will feel more beautiful and touching when sung with beautiful rhythms (Al-Kaheel, 2010).

Based on the The Kruskal-Wallis statistical (h-Test) between groups found no significant difference between diastolic BP before and after the intervention of murottal A, B and C. This also means that the three types of therapy have the same effect on the diastolic BP of the respondents. When compared between the three, version C (verse and its translation) shows a more meaningful change. Increased diastolic BP is a more reliable prognostic sign compared to systolic BP, and if the persistent diastolic BP ≥ 90 mmHg is considered abnormal (Cunningham and Gant, 2010).

The effect of murottal on the human body is enormous. The use of a slow and harmonious tempo, making the chanting of the Qur'an can reduce stress hormones, activate natural endorphins, increase feelings of relaxation, divert attention from fear, anxiety and tension, improve the body's chemical system so that it lowers blood pressure and slows down breathing, pulse heart, pulse, and brain wave activity. The rate of breathing that is deeper or slower is very good for causing calm, controlling emotions, deeper thinking and a better metabolism (Heru, 2008).

Murottal versions A, B and C have the same effect in reducing systolic and diastolic BP in mothers with HDK. This proves that murottal therapy can be done by listening to the recitation of the holy Qur'an, or verses and their translations or translations. Even if individuals do not understand the meaning of the verses of the Qur'an that are read or listened to, they still have a therapeutic effect (Elkadi, A. 1985 in Ibrahim, 2017).

In general, murottal therapy has a significant effect on reducing both systolic and diastolic blood pressure. Based on the type of murottal therapy given, it was found that there was no significant difference between systolic and diastolic BP between the three groups. The three types of murottal therapy that are carried out have the same effect in reducing systolic and diastolic BP, but it is more recommended for health workers to apply murottal therapy which sounds verses and their meanings / translations in HDK patients.

References

Abdullah, A.A. & Omar, Z. (2011). The effects of religious activity on the temporal

EEG signal while. Proceeding of the International Conference on Advanced Science, Engineering and Information Technology, 14-15 Januari 2011.

Al-Kaheel, A. (2010). Panduan metode inovatif menghafal Al Qur'an. Jakarta : Tarbawi Press.

Proceeding of the International Conference on Advanced Science, Engineering and Information Technology 2011 Hotel Equatorial Bangi-Putrajaya, Malaysia, 14 - 15 January 2011 ISBN 978-983-42366-4-9

Proceeding of the International Conference on Advanced Science, Engineering and Information Technology 2011 Hotel Equatorial Bangi-Putrajaya, Malaysia, 14 - 15 January 2011 ISBN 978-983-42366-4-9
Cunningham, F.G. & Gant, N.F. (Ed). (2010). Dasar-dasar ginekologi dan obstetri. Jakarta : EGC

Cunningham, F.G. (Ed). (2012). Obstetri Williams. Edisi 23. Volume 2. Jakarta : EGC

Dinas Kesehatan Provinsi Jawa Barat. (2012). Profil Kesehatan Provinsi Jawa Barat Tahun 2012.

Dinas Kesehatan Provinsi Jawa Barat. (2017). Profil Kesehatan Provinsi Jawa Barat Tahun 2017.

Dinas Kesehatan Kabupaten Kuningan. (2013). Profil Kesehatan Kabupaten Kuningan Tahun 2013.

Fauzan, N., & Abidin, N. A. (2017). The effects of neurotherapy using ayatul kursi as stimulus on memory performance. Journal of Islamic, Social, Economics and Development, 2(4), 22-31.

Hamka, B. (2018). Al Qur'an lafaz dan makna. Diakses dari <http://buyahamka.org>.

Heru. (2018). Efek murottal terhadap tubuh. Diakses dari <https://www.psychologymania.com>.

Ibrahim, N.A., Al Alwan A., Al EiD, A., Al

Ghawa Y. & Al Ghalbi M. (2017). Traditional Islamic medicine utilization among adult patients with cancer in Saudi Arabia. Ec Pharmacology and Toxicology, 4(5), 172-183.

Ismarina, D., Herliawati & Muharyani, P.W. (2015). Perbandingan perubahan TD lansia penderita hipertensi sesudah dilakukan terapi musik klasik dan relaksasi autogenik di Wilayah Kerja Puskesmas Pembina Palembang. Jurnal Keperawatan Sriwijaya, 2(2), 124-129.

Kaheel, A. R. (2017). Healing by listening to Qur'an, Diakses dari <http://kaheel7.com/eng/index>.

Kartini, Fratidhina, Y. & Kurniyati, H. (2016). Pengaruh mendengarkan murottal terhadap penurunan TD pada ibu hamil preeklamsi di RSIAPKU Muhammadiyah Tangerang, JKFT Universitas Muhammadiyah Tangerang, 2, 40-47.

Kementerian Kesehatan RI. (2014). Profil Kesehatan Indonesia.

Kristiyani, D. S. (2013). Laporan kasus : Hipertensi dalam kehamilan. FK Universitas Udayana Denpasar Bali.

Leveno, Kenneth J. (2015). Manual Williams : Komplikasi kehamilan. (Williams manual of pregnancy complication). Edisi 23. Jakarta : EGC.

Mottaghi, M. E, Esmaili, R. & Rohani, Z. (2011). Effect of Qur'an recitation on the level of anxiety in athletics. Qur'an and Medicine, 1(1), 1-4.

Mulyadi, E., Puspitasari, D. I. & Permatasari, D. (2013). Pengaruh musik suara alam terhadap TD ibu hamil di Polindes Pagar Batu Kecamatan Sarongi Kabupaten Sumenep. Jurnal Kesehatan Wiraraja Medika, 3-9.

Puspitasari D.R, Setyabudi M.T. & Rohmani A. (2015). Hubungan usia, graviditas dan indeks massa tubuh dengan kejadian hipertensi dalam kehamilan. Jurnal Kedokteran Muhammadiyah, 2(1).

- Romadoni, S., Aryadi & Rikiyati, D. (2013). Pengaruh terapi musik klasik terhadap penurunan TD pada pasien hipertensi di Rumah Sakit Muhammadiyah Palembang. *Jurnal Masker Medika Stikes Muhammadiyah Palembang*. I(2).
- Ropei, O. & Luthfi, M. (2017). Pengaruh terapi psikoreligi murottal Al Qur'an terhadap TD pada klien dengan hipertensi. *Jurnal keperawatan Aisyiyah (JKA)*, 4(1), 1-12.
- Rosdiana, I. & Cahyati, Y. (2019). Effect of Progressive Muscle Relaxation (PMR) on blood pressure among patient with hypertension. *International Journal of Advancement in Live Sciences Research*, 2(1) :28-35.
- Rozikhan. (2007). Faktor-faktor terjadinya preeklamsia berat di Rumah Sakit Dr. H. Soewon Kendal Semarang, (Tesis). Program Magister Epidemiologi Universitas Diponegoro : Semarang.
- Supriadi, D., Hutabarat, E. & Monica, V. (2015). Pengaruh terapi musik tradisional kecapi suling sunda terhadap TD pada lansia dengan hipertensi. *Jurnal Skolastik Keperawatan*, 1(2), 29-35.
- Wagiyo & Putrono. (2016). Asuhan keperawatan antenatal, intranatal dan bayi baru lahir : Fisiologis dan patologis. Edisi 1. Yogyakarta : Andi.
- WHO. (2011). WHO recommendations for Prevention and Treatment of Pre-Eklampsia and Eklampsia.
- Widayati, S., Misrawati & Woferat, N. (2014). Efektifitas pemberian terapi musik terhadap penurunan TD pada ibu dengan hipertensi pada kehamilan. (Skripsi). *Jurnal Universitas Riau : Riau*.
- Widyastuti, I. W. (2015). Pengaruh terapi murottal surah Ar-Rahman terhadap perubahan TD pada lanjut usia (lansia) penderita hipertensi di Posyandu Lansia Kenanga Wilayah Kerja UPK Puskesmas Siantan Hulu Kecamatan Pontianak Utara. *ProNers*, 3.
- Wirakhmi, I. N., Utami, T., Purnawan, I. (2018). Comparison of listening Mozart music with murottal Al Qur'an on the pain of hypertension patients. *Jurnal Keperawatan Soedirman*, 13(3),100-106.
- Yuliani, R.D., Widyawati, M.N., Rahayu, D.L., Widiastuti, A. & Rusmini. (2018). Terapi murottal sebagai upaya menurunkan kecemasan dan TD pada ibu hamil dengan preeklampsia. *Jurnal Kebidanan*, 8(2).
- Wahyuni, N. (2017). 9 Bulan yang penuh keajaiban menanti buah hati : Amalan-amalan dahsyat untuk ibu hamil hingga melahirkan. Yogyakarta : Araska.
- Zulkurnaini, N. A., Kadir, R.S.S.A., Murat, Z.H. & Isa, R.M. (2012). The comparison between listening to Al Quran and listening to classical music on the brainwave signal for the alpha band. 3rd International Conference on Intelligent Systems Modelling and Simulation, Sabah, 8-10 February 2012, 181-186. doi:10.1109/ISMS.2012.60.