

The effect of murottal Al Qur'an on the dysmenorrhea intensity among senior high school students

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ABSTRACT

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Background: Dysmenorrhea or pain during menstruation is due to excessive contractions during the sloughing of the uterine wall with symptoms of cramping pain in the lower abdomen. The incidence of primary dysmenorrhea in Indonesia is 54.89%. However, many teenagers do not know how to manage the pain. The pharmacological therapy of dysmenorrhea includes painkillers and anti-prostaglandin, while the non-pharmacological approach includes distraction therapy. One of the distraction therapy that is easy to do is murottal Al-Qur'an.

Objective: This study observed the role of listening to murottal Al-Qur'an on the intensity of dysmenorrhea among senior high school students.

Methods: The design of this study is a quasi-experimental pretest-posttest with a control group design. There were 100 subjects aged 15-18 years old. The sampling technique applied purposive sampling. Data analysis of this study applied Wilcoxon, Mann-Whitney, relative risk (RR), and number needed to treat (NNT) test.

Results: The mean pain level in the experimental and control group were 5.42 and 5.56 before intervention. After therapy, the pain level decreased to 2.86 and 5.30 in the experimental and control group, respectively. There was a significant difference in the pain level before and after in the experiment group ($p < 0.001$). Relative risk showed that murottal intervention decreases the pain level by 3.267 times. NNT of the study was 1.467.

Conclusion: Murottal Al-Qur'an significantly reduced the degree of pain with a p-value < 0.001

Latar Belakang: Dismenorea disebabkan oleh kontraksi berlebihan pada saat peluruhan dinding rahim yang tidak dibuahi dan mempunyai gejala nyeri kram pada perut bagian bawah. Data menunjukkan sebanyak 54,89% kasus dismenorea primer di Indonesia dan 15% remaja dismenorea mengeluhkan aktivitasnya terganggu. Beberapa remaja di sekolah belum mengetahui penanganan dismenorea. Obat anti nyeri dan anti prostaglandin merupakan penanganan farmakologi, sedangkan penanganan non farmakologi contohnya terapi distraksi. Salah satu terapi distraksi yang mudah dilakukan adalah murottal Al-Qur'an.

Tujuan: Mengamati pengaruh mendengarkan murottal Al-Qur'an terhadap tingkat nyeri dismenorea.

Metode: Penelitian ini menerapkan metode yaitu quasi eksperimen pretest posttest with control group design. Siswi sekolah menengah atas (SMA) sejumlah 100 subjek diamati dalam penelitian ini. Teknik purposive sampling diterapkan untuk mengambil sampel. Uji Wilcoxon, Mann-Whitney, Relative Risk (RR), NNT (Number Needed to Treat) test digunakan untuk menentukan perbedaan derajat nyeri dan pengaruh murottal Al-Qur'an. Penilaian tingkat nyeri menggunakan VAS (Visual Analog Scales).

Hasil: Rerata tingkat nyeri pada kelompok eksperimen yaitu 5,42 (pretest) dan 2,86 (posttest), sedangkan pada kelompok kontrol yaitu 5,56 (pretest) dan 5,30 (posttest). Terdapat perbedaan bermakna tingkat nyeri sebelum dan sesudah pada kelompok eksperimen ($p < 0,001$), sedangkan pada kelompok kontrol tidak terdapat perbedaan bermakna tingkat nyeri sebelum dan sesudah perlakuan ($p > 0,05$). Relative Risk menunjukkan

intervensi murottal mengakibatkan penurunan nyeri yaitu 3,267 kali. NNT diperoleh sebesar 1,467.

Kesimpulan: *Murottal Al-Qur'an menurunkan tingkat nyeri secara bermakna dengan nilai $p < 0,001$.*

INTRODUCTION

Dysmenorrhea is pain felt before or during menstruation that is caused by excessive contractions during the nonfertilized shedding of the uterine wall, with symptoms of cramps in the lower abdomen. It is the most common complaint experienced by adolescents, yet many teenagers still do not know much about the condition. The prevalence rate of dysmenorrhea in Indonesia is 54.89%. Fitri (2020) and Pradini (2020) found that dysmenorrhea disrupts 87.5% and 15% of learning activities in women and adolescents, respectively.^{1,2} Andriyani et al. (2017) mentioned that 10 out of 15 teenagers experienced menstrual pain and did not know how to handle it properly.³

Two types of dysmenorrhea are primary and secondary dysmenorrhea. Primary dysmenorrhea occurs in adolescence after the first menstruation (menarche) and is not associated with pelvic abnormalities.⁴ In contrast, secondary dysmenorrhea is caused by pelvic pathology and is often found in women aged 30 years and over. The severity of dysmenorrhea assessment is using the pain degree and whether the pain harms daily activities or not. There are several alternatives to manage dysmenorrhea. The pharmacological procedure for dysmenorrhea includes analgesics or anti-prostaglandins and non-pharmacological treatment such as distraction therapy.⁶⁻⁸

Murottal Al Quran is one of the distraction therapies by reading the holy verses of the Quran rhythmically according to the law of reading and correct recitation.⁹ Murottal, a music with a sound intensity of 50 decibels, may positively influence the listener. Sound intensity below 60 decibels can make listeners comfortable, lower the perceived pain and provide a relaxation effect of 65% for the body.¹⁰ Our work aimed to observe the role of listening to murottal Al Quran on the level of dysmenorrhoea pain in senior high school students.

METHODS

The study design was quasi-experimental, using a pretest-posttest control group design.

The control group and experimental group are compared against each other in this research. There are the experimental group and the control group. Each group is given a test on visual analog scales before and after treatment.

The population in this study were students of SMA Muhammadiyah 2 Yogyakarta who experienced dysmenorrhea with an unknown number. The sample size in this study was 55 subjects in each experimental and control group. This study used purposive sampling with sample selection based on inclusion criteria. The inclusion criteria in this study were high school students, Islamic, not having hearing loss, not being sick other than menstrual pain, experiencing pain before or during menstruation, aged less than 20 years, and willing to be the subject of the study. The exclusion criteria for this study were having a history of gynecological disorders, being married, taking anti-pain medication during dysmenorrhea, and quitting.

This study was conducted online via video call. Subjects listened to murottal Al-Quran juz 30 recited by Ustadz Hanan Attaki on social media for 20 minutes through a gadget. The researcher then assessed the pain level before and after treatment with visual analog scales. A value of 0 means that the subject has no pain, 1-3 (mild) means tolerable pain, 4-6 (Moderate) means the pain interferes with activities, and 7-10 (severe) means unbearable pain and unable to perform activities independently.¹¹

The Wilcoxon, Mann-Whitney, Relative Risk (RR), and NNT (Number Required to Treat) tests were used to compare pain intensity and the effect of murottal Al-Quran. If $p < 0.05$ showed a significant difference, on the contrary, p -value > 0.05 means no significant difference. Relative risk indicates the risk of pain reduction with murottal intervention. NNT determines the number of subjects who need intervention to prevent dysmenorrhoea pain from persisting/increasing.

This study obtained an ethical certificate No. 195/EC-KEPK FKIK UMY/VI/2021 issued by the Health Research Ethics Committee of the University.

RESULTS

This study was conducted from August to September 2021. There were 110 subjects in the

early research, followed by five dropouts in each group due to being difficult to contact and not meeting the inclusion criteria. Therefore, 100 participants who fulfilled both the criteria for inclusion and exclusion were selected to participate as the study's subjects. Most participants were 16 and 17 years old and allocated to the control and the experimental group, respectively (Table 1).

In the control group, 42% of the subjects experienced severe pain, while 74% of the experimental group felt moderate pain before

listening to murottal (Table 2). There was a significant difference in the pain level in the control and experimental group at the pretest ($p=0.01$). The pain level after murottal showed that 46% of the control group felt moderate pain, and 68% of the experimental group experienced mild pain.

There was a significant difference in the mean level of pain in the experimental group at the pretest (5.42 ± 1.37) compared to the post-test (2.86 ± 1.44), with a p -value < 0.05 (Table 3). There was an average decrease in the pain level

Table 1. Characteristics of subject age

Characteristics	Control		Experimental	
	Frequency	Percentage	Frequency	Percentage
Age (years)				
15	5	10	2	4
16	30	60	20	40
17	13	26	26	52
18	2	4	2	4

Table 2. Overview of pain levels

Pain Levels	Control		Eksperiment		Total	p^*
	n	%	n	%		
Pre-test	Mild (1-3)	11	22	3	6	0.001
	Moderate (4-6)	18	36	37	74	
	Severe (7-10)	21	42	10	20	
	Total	50	100	50	100	
Post-test	No pain	1	2	3	6	
	Mild (1-3)	11	22	34	68	
	Moderate (4-6)	23	46	12	24	
	Severe (7-10)	15	30	1	2	
	Total	50	100	50	100	

*Chi square

Table 3. Comparison before and after treatment

Pain levels		Mean \pm SD	Δ Mean \pm SD	p^*	p^{**}
Experiment group	Pretest	5.42 \pm 1.37	-2.56 \pm 1.05	<0.001	<0.001
	Posttest	2.86 \pm 1.44			
Control group	Pretest	5.56 \pm 2.34	-0.26 \pm 1.99	0.348	
	Posttest	5.30 \pm 2.38			

*Wilcoxon test, **Mann-Whitney test

Table 4. Comparison between control and experiment groups after treatment

Groups	Dysmenorrhea pain (post-pre)		Total	RR (95% CI)
	Decrease	Increase		
Experiment	49 (98.0%)	1 (2.0%)	50 (100%)	3.267
Control	15 (30.0%)	35 (70.0%)	50 (100%)	(2.135- 4.998)

of 2.56 in the experimental group who received the murottal Al-Quran intervention. On the other hand, there was no significant difference in the mean level of pain at the pretest (5.56 ± 2.34) compared to the post-test (5.30 ± 2.38) with a p-value of 0.348 ($p > 0.05$).

There was a 3.267 times decrease in dysmenorrhea in subjects in the intervention group than the control group subjects (Table 4). The NNT (Number Needed to Treat) in this study is $1.467 \sim 2$, which means it takes two participants who receive the intervention of listening to murottal Al-Quran to prevent one occurrence of dysmenorrhea pain increase.

DISCUSSION

Petraglia et al. said that the cause of primary dysmenorrhea is not well known. The plausible reason is the increased production of prostaglandins (E2 and F2a) which play a crucial role in ischemia and hypoxia. This results in disrupted uterine contractions due to decreased blood flow.¹² Excessive prostaglandins in menstrual blood cause uterine hyperactivity that causes primary menstrual pain.¹³

This study shows that most participants are aged 16 and 17 years old. The result is in line with Armor et al. (2019), which stated that primary dysmenorrhea is a common complaint in women <25 years old.¹⁴ Beddu et al. explained that primary menstrual pain disappears after aging due to reduced uterine nerve function. Primary dysmenorrhea is approximately 10% of incapacitating severe menstrual pain among females during adolescence and early adulthood. Mammo et al. said that participants ages 14–17 years were 2.55 times more likely to experience primary dysmenorrhea than those aged ≥ 18 years (AOR 2.55; 95% CI (1.77-3.68)).¹⁵ Therefore, primary dysmenorrhea is more frequent in young virgin girls and nulliparous, and its prevalence decreases with aging. As a person ages, the width of the cervix increases, and the secretion of prostaglandins decreases.¹⁵

Our analysis proved a significant difference in pain levels in the experimental group before and after treatment ($p < 0.001$). The mean pain level was 5.42 (moderate pain) and 2.86 (mild pain) for pre and post-treatment, respectively. However, in the experimental group, data analysis showed no significant difference in the level of pain before

and after treatment ($p > 0.05$). The pain level before treatment was 5.56 (moderate), with after treatment measured at 5.30 (medium). Previous research by Puspita Sari regarding differences in the level of dysmenorrhea pain by listening to the murottal Al-Quran letter Ar-Rahman for 30 minutes proved the pain level experienced by the subject from moderate to mild pain.¹⁶

The murottal recitation of the Al Quran produces sound waves heard by the ear, which is then transmitted to the vestibulocochlear nerve and become an electrical impulse to the cerebral cortex. The brain then translates the impulses into perception and feeling. A low sound intensity creates a relaxing effect that makes the listener comfortable and calm, resulting in the descent of perceived pain intensity. Besides, comfort and calm feeling occur because of the beta-endorphins (endogenous opiates) produced by the pituitary gland. Endogenous opiates are permanent in blocking pain nociceptors. These beta-endorphins in the peripheral nervous system act as analgesic neurotransmitters from the descending analgesic neural pathway that binds to opiate receptors at the afferent presynaptic terminal. This cascade inhibits pain signals due to the suppression of peptide substances. The activity of listening to murottal Al-Quran creates a relaxing effect for the listener because it has a low sound intensity, below 60 decibels. This condition can make listeners comfortable, reduce pain, and provide a relaxation effect of 65% for the body. Relaxation stimulates a positive consequence on stress, which the hypothalamus responds to by regulating the secretion of the stress hormones such as cortisol, epinephrine, and non-epinephrine in the blood vessels. That causes sympathetic nerve activity in the autonomic nerves to decrease and results in vasodilation of blood vessels throughout the body and reduce peripheral resistance, with impact blood pressure decrease.^{17,18}

Therapy in the form of music or sound must be listened to for at least 15 minutes to provide a therapeutic effect 5. Based on Yuanitasari (2008), explains that 10-15 minutes of music or sound therapy can have a calming impact.¹⁹ The low sound intensity of 50-60 decibels is enjoyable for the listener and has a good effect.²⁰ Al-Quran reading therapy has been shown to activate body cells by converting sound vibrations into waves captured by the body, reducing pain receptor

stimuli. Moreover, the release of endogenous natural opioid analgesics blocks pain nociceptors from the brain.²²

A similar study on 50 post-surgical patients by Murrock et al. set patients to recite prayer therapy after the surgery. They discovered that patients who recited prayer therapy had significantly lower mean pain levels than the control group. Integrative medicine's optimal treatment technique provides patients with scientifically proven medical treatments, compassion, and special attention to their spiritual and emotional needs. Integrating complementary medicine modalities like spiritual beliefs, prayer treatment, and music therapy improves the effectivity of conventional therapy.²³

Murottal Al-Quran contains several health benefits, such as meditation, autosuggestion, and relaxation. This meditation occurs when alpha waves arise when humans are relaxed, sleepy, daydreaming, or imagining when the subject focuses on listening to the murottal Al-Quran.¹⁸ Relaxed conditions are detected through electroencephalography in the presence of alpha waves with the frequency of 8-13 Hz.²⁴ The amplitude and frequency of these waves are maximal in the occipital lobe and are attenuated by opening the eyes and can be maximized during relaxation with closed eyes. In this condition, the human brain will produce the hormones serotonin and endorphins.²⁴

Listening to the murottal Al-Quran as a distraction strategy helps reduce perceived pain and stress. Sound therapy can control stress-related hormones, such as ACTH, prolactin, and growth hormone, and also can enhance endorphin levels to decrease pain. Endorphins are neuroregulatory and engaged in the analgesic system, its located in the hypothalamus and the areas of analgesia system (limbic system and spinal cord). These analgesic properties make endorphins an endogenous opioid. Endorphins may inhibit pre and postsynaptic pain fibers (nociceptors) that are synchronous on the dorsal horn, mediated by pain neurotransmitters.²⁵⁻²⁶

Listening to the Quran results in autosuggestion that provides optimistic and positive thinking, and Muslims believe that all kinds of diseases must have an antidote if Allah SWT wills (HR Muslim). Relaxation state from listening Quran results in the diversion of negative feelings. In

addition, relaxation reduces stress through the hypothalamus by decreasing the secretion of the stress hormone in the blood vessels, which decreases sympathetic nerve activity, vasodilation, and lower peripheral resistance. The positive impact of relaxation is to balance the sympathetic and parasympathetic nervous systems.²⁴⁻²⁸

The study did not use random allocation to assign participants to each group. Researchers did not screen for hearing loss with more standardized and reliable tools such as BERA. Besides, researchers cannot perform constant control over other activities such as eating, drinking, and listening to music.

CONCLUSION

The participants in the experimental group experienced moderate pain (74%) before intervention and decreased to mild pain (68%) after the intervention. This study concludes that murottal Al-Qur'an can reduce dysmenorrhea significantly with a p-value of <0.001 and NNT (Number Needed to Treat) as much as two, meaning that two subjects are needed to prevent one incidence of dysmenorrheal pain from remaining or increasing.

CONFLICT OF INTEREST

There is no conflict of interest in this research

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