

# memory kerja jurnal aisyah

*by* Indri Septadina

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The Effect of Reciting Holy Qur'an Toward Short-Term Memory

Indri Seta Septadina<sup>1\*)</sup>; Elpita Miftahul Jannah<sup>2</sup>; Puji Rizki Suryani<sup>3</sup>

1\*) Department of Anatomy, Faculty of Medicine, Sriwijaya University

2) Medical Education Study Program, Faculty of Medicine, Sriwijaya University

3) Section of Psychiatric Medicine, Faculty of Medicine, Sriwijaya University

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ABSTRACT

Working memory is a short-term memory that persists for seconds or minutes and can be stored in long-term memory. Murottal Qur'an is a recording of the recitation of the Qur'an, which is voiced by a Qori ('reader of the Qur'an') rhythmically. The recitation of the holy verses of the Qur'an by a Qori is played through a zoom meeting by paying attention to recitation, which has a certain rhythm so it can stimulate activation in the brain area. This study aims to analyze the effect of the reciting Holy Qur'an on working memory in students of the Medical Education Study Program, Faculty of Medicine, Sriwijaya University. An experimental study with a cross-sectional approach with one group pretest-posttest design was carried out from July to December 2020 through the Zoom meeting application. The pretest and posttest examinations used in this study were digit span examinations, in the form of tasks containing digits forward and digits backwards before and after receiving the audio of Al-Qur'an intervention for seven days at 22.00. The data were tested for normality by Shapiro-Wilk, then analyzed using the Paired t-test or Wilcoxon using the Statistical Package for the Social Sciences (SPSS) program. Forty-five students are the research subjects. The results of the Wilcoxon test showed significant results of reciting the Holy Qur'an on working memory ( $p=0.000$ ) in students of the Medical Education Study Program, Faculty of Medicine, Sriwijaya University.

Kata kunci:

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\*) corresponding author

Department of Anatomy, Faculty of  
Medicine, Sriwijaya University  
UPPM Fakultas Kedokteran Universitas  
Sriwijaya Palembang

Email: indrisetaseptadina@fk.unsri.ac.id

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ABSTRAK

Memori kerja adalah bentuk memori jangka pendek yang bertahan biasanya dalam hitungan detik atau menit atau dapat disimpan dalam memori jangka panjang. Murottal Qur'an adalah rekaman bacaan al-Qur'an yang disuarakan oleh seorang Qori' (pembaca al-Qur'an) dengan berirama. Lantunan ayat-ayat suci al-Qur'an oleh seorang Qori' yang diperdengarkan melalui zoom meeting dengan memperhatikan tajwid dan tartil yang mempunyai ritme tertentu sehingga dapat merangsang aktivasi pada area otak. Penelitian ini bertujuan untuk menganalisis pengaruh murottal Qur'an terhadap memori kerja pada mahasiswa Program Studi Pendidikan Dokter Fakultas Kedokteran Universitas Sriwijaya. Penelitian ini menggunakan jenis penelitian eksperimental dengan pendekatan cross-sectional with one group pretest-posttest design melalui aplikasi Zoom meeting. Pemeriksaan pretest dan posttest yang digunakan dalam penelitian ini adalah pemeriksaan digit span, berupa tugas yang berisi digits forward dan digits backward pada sebelum dan sesudah mendapatkan intervensi murottal Al-Qur'an selama 7 hari berturut-turut pada jam 22.00. Pada data dilakukan uji normalitas Shapiro-Wilk, selanjutnya dianalisis dengan menggunakan uji Paired t-test atau Wilcoxon menggunakan program Statistical Package for the Social Sciences (SPSS). Terdapat 45 mahasiswa yang menjadi subjek penelitian. Hasil dari uji Wilcoxon didapatkan hasil signifikan murottal al-Qur'an terhadap memori kerja ( $p=0,000$ ) pada mahasiswa Program Studi Pendidikan Dokter Fakultas Kedokteran Universitas Sriwijaya.

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## INTRODUCTION

Working memory is a short-term memory that persists for seconds or minutes or can be stored in long-term memory. (Ranganath et al., 2015) Working memory plays an important role in describing human intelligence, such as top-down attention, abstract thinking, making decisions, and planning actions. (Mendoza-Halliday et al., 2015) Low working memory can happen to everyone, especially academic students which causes difficulties in receiving lesson information, causing low academic achievement. (Aziza et al., 2019) Al-Quran is a guide for Muslims to carry out Allah's commands and stay away from His prohibitions. For those who believe in it, the Qur'an is a cure for a disease and mercy. Moreover, it will only add harm to those who ignore it. (Nadimah, 2018) Reading the Qur'an can affect the focus of attention in its implementation requires a more complex process when compared to reading ordinary reading books. When reading the Quran, concentrate and focus on the letters, punctuation marks, and short length must be considered carefully. It can make a person can become more focused on attention and concentrate. (Julianto & Etsem, 2011)

In a previous study conducted on 32 female students of the State Islam University of Sunan Gunung Djati Bandung who listened to the murottal Al-Qur'an, there was an increase in the average digit span score of 1.25, which was higher than the group who did not listen to the murottal Al-Qur'an of 1.09. Murottal Al Qur'an is known to have a beautiful tone that stimulates activation in some regions of the brain. Listening to the sound of the Qur'an can also stimulate the temporal lobe, which contains the hippocampus which is the center of memory. (Julianto & Etsem, 2011) This study aims to determine the effect of the murottal Qur'an on working memory in students of the 2017 Medical Education Study Program, Faculty of Medicine, Sriwijaya University.

## METHOD

### Participant characteristic and research design

It was an experimental study with a cross-sectional with the group pretest-posttest design. This research design used to examine the effect of a treatment on the dependent variable. The research was conducted by comparing the pretest and posttest of the dependent variable in the experimental group. The population in this study were 45 students of the Medical Education Study Program, Faculty of Medicine, Sriwijaya University, who met the inclusion and exclusion criteria. The inclusion criteria in this study were active students from the 2017 class and were Muslim. While on criteria, Exclusion is not willing to become respondents and every day to listen to murottal Qur'an every day.

### Experimental method and sampling procedures

The pretest and posttest examinations used in this study were digit span examinations. This examination is carried out online using the Zoom Meeting application, in the form of a task containing digits forward (a series of numbers ranging from 2 to 9 digits) and digits backward (a series of numbers ranging from 2 to 8 digits) readout and then study participants were asked to write down the digits in sequence. Specified in the questionnaire provided.

Explanation of research objectives, informed consent/respondent consent, and pretest questionnaires will be provided in a google form. Respondents will be selected randomly, and all students have the same probability of being selected as respondents. After the pretest finished, the respondent will be given intervention in the form of a recording of the murottal Qur'an sung by Mishary Rasyid Al-Afasy, which will be played to the respondent through the Zoom Meeting application. The murottal Qur'an intervention will be given every 22.00 WIB for seven consecutive days with a duration of 18 minutes using Surah Al-Mulk and Surah Al-Hasyr. Based on previous research, the murottal Qur'an intervention given was different, ranging from 1 day, 7 days, 14 days, and 30 days. The duration of the murottal Qur'an intervention in previous studies also varied from 5 minutes to 30 minutes. (Julianto & Etsem, 2011)

### Data analysis

Fortiming, the researcher considers the effectiveness of time, avoids bias in the sample, considers the respondent in a relaxed state, and considers the effectiveness of time. The surah used in this study is surah Al-Mulk and surah Al-Hasyr by considering the virtues of the two surahs and considering the previous research. After receiving the intervention for 7 days, on the last day the respondents were asked to do a posttest in the form of digit span forward and backward. The data that has been collected through the questionnaire will be recorded and observed according to the variables studied. The collected data was then processed using the Statistical Package for the Social Sciences (SPSS) version 25. The analysis was carried out in univariate analysis to determine anxiety before and after murottal intervention and bivariate analysis to determine differences in anxiety before and after murottal Al-Qur'an intervention. A normality test with the Saphiro-Wilk before analyzing the difference in anxiety. Then the data were analyzed by the Wilcoxon test.

## RESULTS AND DISCUSSION

From the distribution table of the characteristics of research subjects based on age, it can be seen that from 45 samples, the minimum age of the sample was 20 years (n=2), the median age was 21 years (n=42) the maximum age was 22 years (n=1). Furthermore, for the distribution of the characteristics of research subjects based on gender, it can be seen that the study contained 20% male (n = 9) and 80% female (n = 36).

**Table 1.**  
**Distribution of Research Subject Characteristics (n=45)**

Characteristic	N	%
Age (years)		
20	2	4,4
21	42	93,3
22	1	2,2
Gender		
Male	9	20,0
Female	36	80,0

From the distribution table of research subjects based on digit span scores before and after the murottal al-Qur'an intervention on 45 students, the minimum score was 5, and

the maximum value was 15, so the average value was 10.51. (Table 2)

**Table 2.**  
**Distribution of subjects based on digit span scores**

Category	n	Mean ± SD	Median	Min - Max
Pretest	45	10,51 ± 2,76	11	5 – 15
Postes	45	14,35 ± 2,11	11	9 – 17

A normality test needs to be done before analyzing the statistical differences in research values before and after the murottal Al-Quran intervention. The normality test used was Shapiro-Wilk because the sample was small (n 50). In the normality test results, the p-value before (p=0.021) and p-value after (p=0.000) were less than 0.05, which means that the digit span scores before and after the Al-Quran murottal intervention were not normally distributed (Table 3)

**Table 3**  
**A normality test of digit spans cores before and after Alquran intervention**

Category	n	Saphiro Wilk	p-value
Pretest	45	0,940	0,021
Postes	45	0,885	0,000

Because it was not normally distributed, the digit span score data before and after the Al-Quran murottal intervention were statistically analyzed using the Wilcoxon test. The results of the Wilcoxon test obtained a p-value of <0.05 (p = 0.000) which means that there is a significant relationship between murottal Al-Quran and working memory. This means that murottal Al-Quran can affect working memory in students of the medical education study program, Faculty of Medicine, Sriwijaya University.

**Table 4.**  
**Comparison of Digit Span Scores Before and After Intervention Murottal Al-Quran**

Digit span score	n	Median (min-max)	p-value
Pretest	45	11,00(5;15)	0,000
Postes	45	15,00(9;17)	0,000

Research subjects based on digit span scores before the murottal al-Qur'an intervention on 45 students of the medical education study program, Faculty of Medicine, Sriwijaya University, obtained a minimum score of 5 and a maximum score of 15 so that an average value of 10.51 was obtained. The results of this study are similar to the research conducted by 5 who also researched calculating working memory with digit span. The mean pretest score in the experimental group was 10.4. Digit span score on after intervention murottal Quran against 45 students of medical education force Sriwijaya University School of Medicine in 2017 found 9 minimum value and a maximum value of 17 to obtain an average value of 14.36.

The results of this study are similar to the research conducted by 5, who also conducted research on calculating working memory with digit span. The average posttest score in the experimental research group was 11.2. In the Wilcoxon normality test results, the p-value before p=0.000 (p<0.005) and the p-value after p=0.000 (p<0.005) showed that there was a significant difference in the digit

span scores before and after the murottal Qur'an intervention. Murottal Qur'an can affect working memory in students of the medical education study program, Faculty of Medicine, Sriwijaya University.

The research conducted by 5, 4 and 2 that murottal qur'an can improve one's concentration and working memory. Jenkins research conducted in 2001 said that listening to the strains of tone or music can activate areas in the brain related to spatial reasoning (prefrontal, temporal, and precuneus areas). The strains of the murottal Qur'an can also generate alpha waves in the part of the brain that plays a role in optimizing spatial memory. (Aziza et al., 2019) Auditory stimulation in the form of sound could provide vibrations that will reach the ears, and then the vibrations will spread throughout the body. After that, the cells that will be affected by sound vibrations will then respond by changing the received vibration. (Trower, 2012) This means that the work of the cells increases and becomes stronger. Vibrating brain cells then send magnetic waves and electromagnetic waves that represent the activity of brain cells. (Julianto & Etsem, 2011)

Previous research suggests that listening to murottal from surah al-Mulk can increase alpha waves by as much as 90%. This result proves that the subject becomes more relaxed after the intervention. (Ishmata et al., 2021) Increased alpha waves can activate the work of the frontal lobe. The frontal lobe functions to process working memory, memory retrieval, speech production, and recognition of written words. (Thompson-Schill et al., 2005) Especially the relaxed state in the hippocampus can optimize the work of the memory center. (Fauzan & Abidin, 2017) Alpha waves also play a role in the development of neuronal plasticity in the brain, namely by stimulating changes in signaling pathway for the expression of the effects of Brain-Derived Neurotrophic Factor (BDNF) and receptor tyrosine kinase receptor B (TrkB), which play a role in the formation process of spatial memory. (Zhao et al., 2017)

#### Limitation of The Study

This study has limitations. This research was conducted online through a zoom meeting so that researchers could not control for other confounding factors. The method used in this study was quasi-experimental without a control group.

#### CONCLUSIONS AND SUGGESTIONS

Based on this study, it can be concluded that the results of the digit span forward and backward pretest before the murottal al-Qur'an intervention obtained an average value of 10.51, and the posttest results obtained an average value of 14.36. Thus, there is an effect of murottal Qur'an on working memory (p<0.05) in the Medical Education Study Program Students, Faculty of Medicine, Sriwijaya University.

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#### Conflict of interest

The authors declared no conflict of interest.

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