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Al-Quran Recitation Therapy with Surah Ar-Rahman on Students' Sleep Quality: A Randomized Controlled Trial

Terapi Murottal Al-Quran dengan Surah Ar-Rahman Terhadap Kualitas Tidur Siswa: Sebuah Uji Terkontrol Acak

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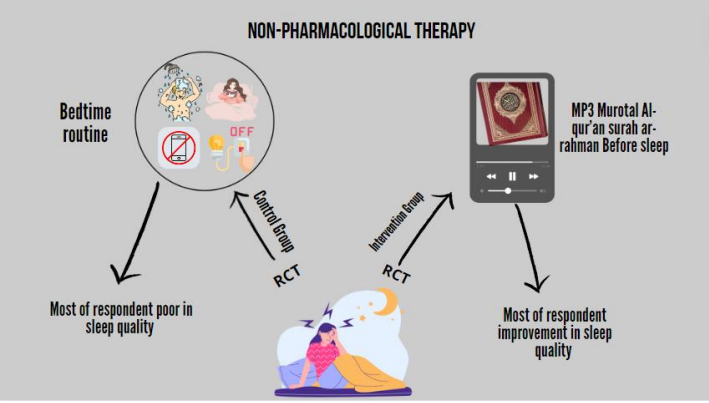
Abstract
Sleep quality is the level of sleep satisfaction experienced by a person which includes the components of sleep quantity, sleep continuity, and fresh and fit when waking up. Poor sleep quality is associated with psychiatric disorders, such as depression and anxiety. Recitation (Murottal) Al- Quran Surah Ar-Rahman Therapy is the chanting of the holy verses of Al-Quran Surah Ar-Rahman which is given to someone to have a relaxing effect. The research was conducted on students using the randomized control trial experimental research method with pre and post approaches with the control group. The study was conducted on 36 respondents (18 respondents in the intervention group and 18 respondents in the control group). The results showed that there was an increase in sleep quality by 13.2% in the intervention group after therapy. The mean difference in sleep quality which showed an increase in sleep quality was 0.11 greater in the intervention group than the control group, but not significant (p=0.908, α=0.05). There was an increase in sleep quality for students after being given Murottal Al Quran Surah Ar-Rahman therapy. Further research is needed with a longer treatment time and it is necessary to study the factors that most influence the sleep quality of master students.

Abstrak
Kualitas tidur merupakan tingkat kepuasan tidur yang dialami seseorang yang meliputi komponen kuantitas tidur, kontinuitas tidur, serta perasaan segar dan bugar saat bangun tidur. Kualitas tidur yang buruk dikaitkan dengan gangguan kejiwaan, seperti depresi dan kecemasan. Terapi mengaji (Murottal) Al-Quran Surah Ar-Rahman adalah lantunan ayat suci Al-Quran Surah Ar-Rahman yang diberikan kepada seseorang untuk memberikan efek relaksasi. Penelitian dilakukan terhadap siswa dengan menggunakan metode penelitian eksperimen randomized control trial dengan pendekatan pre dan post dengan kelompok kontrol. Penelitian dilakukan terhadap 36 responden (18 responden kelompok intervensi dan 18 responden kelompok kontrol). Hasil penelitian menunjukkan terdapat peningkatan kualitas tidur sebesar 13,2% pada kelompok intervensi setelah terapi. Perbedaan rata-rata kualitas tidur yang menunjukkan peningkatan kualitas tidur pada kelompok intervensi lebih besar 0,11 dibandingkan kelompok kontrol, namun tidak signifikan (p=0,908, α=0,05). Terdapat peningkatan kualitas tidur santri setelah diberikan terapi Murottal Al Quran Surah Ar-Rahman. Diperlukan penelitian lebih lanjut dengan waktu perawatan yang lebih lama dan perlu dipelajari faktor-faktor yang paling mempengaruhi kualitas tidur mahasiswa magister.

Graphical Abstract



Keyword
mental disorders; murottal al-quran, music therapy; sleep quality; students

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INTRODUCTION

Sleep is a period of rest for the human body which is useful for improving energy, nerve function, and body functions. Sleep quality is the level of sleep satisfaction experienced by a person which includes components of sleep quantity, sleep continuity, and feeling refreshed when awake (Wang & Bíró; 2021). Good sleep quality will have a positive impact on physical and mental health, the learning process, and one's performance (Ming et al., 2011). Poor sleep quality is characterized by subjective negative perceptions of sleep, the time it takes to fall asleep, sleep duration, and difficulty regulating sleep and daily activities. Poor sleep quality is usually associated with psychiatric disorders, such as depression, anxiety, cognitive difficulties, which affect decreased physical health, premature aging, and low performance (Ruiz-Zaldibar et al., 2022).

Many factors affect sleep quality, including lifestyle, mental health, social factors, physical factors (Henrich et al., 2020; João et al., 2020; Reis et al., 2020; Sejbuk et al., 2022). Lifestyle factors include smoking, physical activity, eating habits, body mass index, caffeine and alcohol, media use habits (smartphone addiction, internet use, sleeping position, curfew use, low screen time), irregular sleep-wake patterns, habits, and naps (Kubiszewski et al., 2014; Riera-Sampol et al., 2022; Vargas et al., 2014). Mental health factors include depression, psychiatric disorders, stress perception, and anxiety. Social factors include racial discrimination, social Many factors affect sleep quality, including lifestyle, mental health, social factors, physical factors. relationships, academic appearance, knowledge of sleep. Physical factors include pain, fatigue, and sleep medication (Wang & Bíró; 2021).

There are various ways to improve sleep quality, including using music. Music therapy can improve the quality of sleep in students. This therapy is a non-pharmacological therapy aimed at overcoming sleep problems, music therapy is a pain-free, safe, capable therapy, no side effects, and can be used in various health areas (Kavurmaci et al., 2020). Closed loop acoustic stimulation aims to push neural activity toward deeper, deep sleep states that are difficult to awaken (Barnes et al., 2023).

According to the Great Dictionary Indonesian, music is the science or art of arranging tones or sounds in sequences, combinations, and temporal relationships to produce compositions (sounds) that have unity of continuity. Chanting the holy verses of the Quran or murottal Al-Quran is also the art of arranging tones or sounds in order so that there is a continuous unity. Quran murottal therapy is the chanting of the holy verses of the Quran given to a person to provide a relaxing effect (Mirza, 2014). The relaxing effect activates endorphins that can increase feelings of comfort or relaxation, divert fear and anxiety, improve the body's hemodynamics so that it can reduce high blood pressure, and can improve sleep quality (Sumaryani & Puspita Sari, 2017).

College students are one of the population groups that often experience disorders related to sleep quality. Social pressure, academic tasks, and irregular schedules trigger sleep disorders in college students (Wang & Bíró; 2021). Sleep deprivation and sleep disturbances are the main characteristics that indicate low sleep quality in college students. About 40%-65% of college students in America experience low quality sleep. Symptoms of anxiety and depression are consistently associated with poor sleep, whether it is related to sleep quality, latent sleep period, sleep duration, and sleep efficiency (Becker et al., 2018).

Several studies have found several benefits of Quran therapy such as addressing students' anxiety issues (Rianti et al., 2021), as a psycho-spiritual therapy (Kannan et al., 2022) and as a therapy on cancer patients (Rosyidul'Ibad & Napik, 2021). Therefore, it is very important to examine these two things together, namely mental health and sleep problems in college students. From a preliminary study conducted on 14 FIK UI students, 11 of them slept more at night after college than before college. In addition, 10 of the 14 students felt a decrease in sleep quality after the lecture period, 6 of whom stated that the decrease in sleep quality was related to the process of completing coursework. For this reason, further research is needed on the quality of student sleep and the effectiveness of Qur'anic murottal therapy on sleep quality.

METHODS

The study used an experimental randomized control trial (RCT) design with Pre-post-test with control group design. The inclusion criteria are master students of the Faculty of Nursing and Muslims. The exclusion criteria are students who experience hearing loss, have chronic diseases, take drugs that have a sedation / drowsiness effect, and consume caffeine at night. Data collection will be carried out in March 2023 at one of the Faculties of Nursing in Jakarta. Researchers conducted pre-tests in the inter-

Table 1
Distribution of Respondents by Gender

Variable	Total (n=36)	%
Male	6	16.7
Woman	30	83.3

vention group and control group to determine the initial score of sleep quality and confounding factor scores consisting of psychological, physical activity, sleep hygiene, and social support. Then the researchers gave an MP3 file of the Quran murottal Surat Ar Rahman to the intervention group to listen to while going to sleep for 14 days and directed the control group to carry out the usual bedtime routine of each respondent. Every day researchers sent reminder messages to the intervention group to listen to MP3s of the Quran before each bed and evaluate whether the activities were performed or not. On the 15th day, post-test activities were carried out in the intervention group and control group.

The questionnaire had six components: (1) The demographic questionnaire (2) Pittsburgh Sleep Quality Index (3) DASS-21 (4) Sleep Hygiene Index (5) SPS 24 (6) activity index. The demographic questionnaire includes gender and age, PSQI (Pittsburgh Sleep Quality Index) which has categories for assessing good sleep quality ≤ 5 and poor sleep quality > 5), then DASS version 21 for assessing stress, anxiety and depression, then the Sleep Hygiene Index to assess routine carried out before going to bed and SPS Version 24 to assess social support and finally the activity index to assess activities carried out in the last 1 month.

RESULTS

Based on the Table 1, it was found that respondents in this study were more female (83.3%) than male (16.7%). Based on the Table 2, it was found that the average age of respondents was 38.08 years with a standard deviation value of 5.81 years, where the age of the youngest respondent was 25 years and the oldest age was 49 years and it can be believed (95% CI) that the average age of respondents in this study was 36.12 years to 40.05 years. The average value of social support of respondents is 23.22 with a standard deviation value of 20.27 where the lowest level of social support is 4 and the highest is 40 and it is believed (95% CI) that the level of social support of respondents is in the range of 16.36 to 30.08. The results of the psychological assessment of respondents, consisting of depression, anxiety, and stress. The mean depression score is 6.75 with a standard deviation of 5.72 where the lowest value is 0 and the highest is 19 and it is believed (95%CI) that the depression score ranges from 6.23 to 11.21. The mean anxiety score is 6.78 with a standard deviation of 5.23 where the lowest value is 0 and the highest is 17 and it is believed (95% CI) that the anxiety score is in the range of 6 to 10.66. The mean stress score is 5.08 with a standard deviation of 5.12 where the lowest value is 0 and the highest is 19 and it is believed (95% CI) that the anxiety score is in the range of 3.96 to 8.38. The average Sleep Hygiene score of respondents in this study was 16.05 with a standard deviation of 7.66 where the lowest score was 2 and the highest score was 33 and it is believed (95% CI) that the respondents' Sleep Hygiene scores ranged from 13.46 to 18.64. Furthermore, for the average physical activity score of respondents was 8.1 with a standard deviation of 1.32 where the lowest score was 5.40 and the highest score was 11.15 and it is believed (95% CI) the respondents' physical activity was of 7.65 to 8.55.

Table 2
The Socio-Demographic Respondents

Variable	n	Mean	SD	Min-Max	95% CI
Characteristic					
Age	36	38.08	5.81	25 - 49	36.12 ; 40.05
Social Support	36	23.22	20.27	4.00 - 40.00	16.36 ; 30.08
Psychology					
Depression	36	6,75	5,72	0-19	6,23; 11,21
Anxiety	36	6,78	5,23	0-17	6,00; 10,66
Stress	36	5,08	5,12	0-19	3,96; 8,38
Sleep Hygiene	36	16.05	7.66	2.00 - 33.00	13.46 ; 18.64
Physical Activity	36	8.1	1.32	5.40 - 11.15	7.65 ; 8.55

Table 3
The sleep quality between control and intervention groups

Variable	n	Mean	Sd	Md	95% CI
Intervention	18	9.22	3.04	0.94	-0.97 ; 2.86
Control	18	8.28	2.585		

. Based on the Table 3, it was found that the average sleep quality score in the intervention group was 9.22 with a standard deviation of 3.04 in the control group, the average score difference was 0.49, which is 8.28 with a standard deviation of 2.58, and it is believed (95% CI) that the sleep quality score in this study was in the range of -0.97 to 2.86.

Table 4 shows that in the intervention group there was a decrease in sleep quality score which means there was an increase in sleep quality. Even though statistically the p value was 0.104 (> 0.05) which means there was no statistically significant difference in the average sleep quality score between before and after the administration of Murrotal Al Quran Surat Ar-Rahman therapy in the intervention group. In the control group, there was a decrease in scores on sleep quality measurements, which meant an increase in sleep quality, although statistically obtained a value of 0.099 (>0.05), which means there was no significant difference in average sleep quality scores between before and after the administration of Quranic murrotal therapy, Surat Ar-Rahman in the control group.

Table 5 shows that there was a difference in average difference in sleep quality between the intervention group and the control group of 0.11. The results of the statistical test showed that the p value was 0.908 (>0.05) which means there was no significant difference in average difference in sleep quality in the control group and the intervention group.

DISCUSSION

Respondents in this study were more female, namely 30 respondents (83.3%) compared to men who amounted to 6 respondents (16.7%). The data obtained is primary data obtained from filling out questionnaires by samples. Meanwhile, the age of respondents in this study was an average age of 38 years. Based on the categorization of age groups according to the Ministry of Health of the Republic of Indonesia, the age of 38 years is included in the late adult category (Sonang et al., 2019). Late adulthood is a time when a person is going through good and bad times in life and the process of thinking about how a person solves his problems so that various psychological problems and insomnia often appear during this period (Girdhar et al., 2020).

The average social support score in this study was 23.22. This score illustrates that the social support that respondents have is good. The psychological score in this study consisted of an average depression score of 6.75, an average anxiety score of 6.78, and an average stress score of 5.08. All three psychological values are in the normal category. The average sleep hygiene score in this study was 16.05. This score shows that respondents have good sleep hygiene. Sleep hygiene is a term used to describe interventions or habits carried out before bed to get good quality sleep (Tandon et al., 2020). The average result of the physical activity score in this study was 8.1 where this score showed that respondents had a physical activity category of >7 which means respondents had moderate physical activity. Then, the average sleep quality score in respondents in the intervention group was 9.22 and, in the control, group was 8.28 indicating the sleep quality score of respondents >5 which means that respondents in the intervention group and control group had poor sleep quality.

Based on the average sleep quality score, there was a decrease in the average sleep quality score in

Table 4
Differences in Average Sleep Quality Scores

Group	Variable	N	Mean	SD	CI 95%	t	Df	P-value
Intervention	Pre-intervention	18	9.22	3.04	(-2.72-0.28)	-1.72	17	0.104
	Post-intervention	18	8	2.72				
Control	Pre-intervention	18	8.28	2.58	(-2.45-0.23)	-1.74	17	0.099
	Post-intervention	18	7.17	1.757				

Table 5
Difference in Average Sleep Quality

Variable	Group	N	Mean	SD	MD (CI 95%)	t	Df	P-value
Sleep Quality	Intervention	18	1.22	3.02	0.11(-1.83-2.05)	0.12	34	0.908
	Control	18	1.11	2.7				

the intervention group before and after Quran murrotal therapy, which meant an increase in sleep quality in

the intervention group respondents, which was 13.2%. Although this figure is not significant, this improvement in sleep quality is in accordance with the theory that states that Quran Murrotal Therapy provides a relaxing effect. The relaxing effect activates endorphins that can increase feelings of comfort or relaxation, divert fear and anxiety, improve the body's hemodynamics so that it can reduce high blood pressure, and can improve sleep quality (Sumaryani, & Puspita Sari, 2015).

However, the improvement in sleep quality that occurred in the intervention group was no significant difference with the control group. In the control group, sleep quality increased by 13.4%. When compared to the intervention group, there was a difference in sleep quality improvement of 0.2% higher in the control group compared to the intervention group. These results are in line with studies conducted by Nurani (2019) found that there is an effectiveness in improving sleep quality by listening to Quran murottal before going to bed. A study conducted by Novianti (2020) also found the effect of giving Quran murottal therapy on the quality of sleep of pregnant women. In addition, a study conducted by Supriyanti (2021) and a study by Anggraeni et al. (2023) found the effectiveness of the Qur'an murottal to overcome insomnia in the elderly.

This happens because many factors affect sleep quality, including lifestyle, mental health, social factors, physical factors. Lifestyle factors include smoking, physical activity, eating habits, body mass index, caffeine and alcohol, media use habits (smartphone addiction, internet use, sleeping position, curfew use, low screen time), irregular sleep-wake patterns, habits, and naps. Mental health factors include depression, psychiatric disorders, stress perception, and anxiety. Social factors include racial discrimination, social relationships, academic appearance, knowledge of sleep. Physical factors include pain, fatigue, and sleep medication (Wang & Bíró; 2021).

The mind and soul that are always filled with anxiety, anxiety, worry and excessive fear will have a bad impact on oneself, especially on the quality of sleep . In the Islamic perspective, one of the causes of this is anxiety, anxiety, worry, and fear. Allah says in Qs. Al-Ankabut/29:45 which translates:

> *"Recite, (O Muhammad), what has been revealed to you of the Book and establish prayer. Indeed, prayer prohibits immorality and wrongdoing, and the remembrance of Allah is greater. And Allah knows that which you do."*

In Tafsir Al-Qurthubi it is explained that performing prayers on time and perfecting all the pillars contained in it, without exception. While the purpose of prayer can prevent heinous acts and munkar is that praying 5 times can abort sins and anxiety in a person. A person who is diligent in worship will be optimistic that Allah SWT will help and direct his life to the right path. The enjoyment of life will be obtained, namely life becomes directed, calm, light, and happy. Everything experienced is absolutely due to the will of Allah SWT. Maintaining worship well will bring benefits to life including, tranquility.

CONCLUSIONS

The results showed that the characteristics of respondents were in the range of 25-49 years and the gender of respondents was dominated by women. The age and sex characteristics of respondents in the control group and intervention group were homogeneous. The results of the homogeneity analysis of data on sleep quality, psychology, physical activity and social support were equivalent between the control and intervention groups while sleep hygiene data found that there were differences in the control and intervention groups. Based on this study, it can be concluded that there was an improvement in sleep quality in students after being given Murottal Al Quran Surat Ar-Rahman therapy but did not occur significantly in both the control group and the intervention group. Likewise, the difference in sleep quality in the intervention and control groups was different, but not significant. The researchers suggest further research with longer intervention times and assessment of other factors that affect sleep quality.

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AUTHORS' CONTRIBUTIONS
Nurlela Lantu and Asih Fujiasih designed the study, wrote the manuscript, collected and analyzed the data. Pindi Kurniawati and Syamsuriati acquired and analyzed the data, revised and performed manuscript. All Authors read and approved the final manuscript

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COMPETING INTERESTS
The author(s) declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

Anggraeni, D. N., Antari, I., & Arthica, R. (2023). Pengaruh Terapi Murottal Al-Qur'an Surah Ar-Rahman Terhadap Kualitas Tidur Lansia Di Upt Rumah Pelayanan Lanjut Usia Terlantar Budhi Dharma Yogyakarta. *Journal of Health (JoH)*, *10*(1), 079-085. https://doi.org/10.30590/joh.v10n1.577

Barnes, C. M., Guarana, C., Lee, J., & Kaur, E. (2023). Using wearable technology (closed loop acoustic stimulation) to improve sleep quality and work outcomes. *Journal of Applied Psychology*. https://doi.org/10.1037/apl0001077

Becker, S. P., Jarrett, M. A., Luebbe, A. M., Garner, A. A., Burns, G. L., & Kofler, M. J. (2018). Sleep in a large, multi-university sample of college students: sleep problem prevalence, sex differences, and mental health correlates. *Sleep health*, *4*(2), 174-181. https://doi.org/10.1016/j.sleh.2018.01.001

Dharma, K., K., (2019). *Nursing Research Methodology*. Jakarta: Trans Info Media

Girdhar, R., Srivastava, V., &; Sethi, S. (2020). Managing mental health issues among elderly during COVID-19 pandemic. *Journal of geriatric care and research*, *7*(1), 32-35.

Henrich, L. C., Antypa, N., & Van den Berg, J. F. (2021). Sleep quality in students: Associations with psychological and lifestyle factors. *Current Psychology*, *42*(6), 4601–4608. https://doi.org/10.1007/s12144-021-01801-9

João, K. A. D. R., Jesus, S. N. de, Carmo, C., & Pinto, P. (2018). The impact of sleep quality on the mental health of a non-clinical population. *Sleep Medicine*, *46*, 69–73. https://doi.org/10.1016/j.sleep.2018.02.010

Kannan, M. A., Ab Aziz, N. A., Ab Rani, N. S., Abdullah, M. W., Rashid, M. H. M., Shab, M. S., & Muzaimi, M. (2022). A review of the holy Quran listening and its neural correlation for its potential as a psycho-spiritual therapy. *Heliyon*. https://doi.org/10.1016/j.heliyon.2022.e12308

Kavurmaci, M., Dayapoğlu, N., &; Tan, M. (2020). Effect of music therapy on sleep quality. *Alternative Therapies in Health and Medicine*, *26*(4), 22–26.

Kubiszewski, V., Fontaine, R., Rusch, E., & Hazouard, E. (2014). Association between electronic media use and sleep habits: An eight-day follow-up study. *International Journal of Adolescence and Youth*, *19*(3), 395-407. https://doi.org/10.1080/02673843.2012.751039

Ming, X., Koransky, R., Kang, V., Buchman, S., Sarris, C. E., &; Wagner, G. C. (2011). Sleep insufficiency, sleep health problems and performance in high school students. *Clinical Medicine Insights: Circulatory, Respiratory and Pulmonary Medicine*, *5*(1), 71–79. https://doi.org/10.4137/CCRPM.S7955

Mirza, Iskandar. (2014). *Healthy With the Quran*. Bandung: Salamadani.

Noviyanti, N., Rahmi, R., Dewi, R., & Nurdahliana, N. (2021). Pemberian Terapi Murattal Al-Quran terhadap Kualitas Tidur Ibu Hamil Primigravida Trimester III. *Jurnal Kebidanan Malahayati*, *7*(2), 287-294. http://dx.doi.org/10.33024/jkm.v7i2.3970

Nurani, R. D., Rochmawati, E., &; Nurchayati, N. (2019). The effectiveness of Qur'anic murottal therapy on sleep quality in hemodialysis patients. *JHeS (Journal of Health Studies)*, *3*(2), 78–85. https://doi.org/10.31101/jhes.525

Reis, C., Pilz, L. K., Keller, L. K., Paiva, T., & Roenneberg, T. (2020). Social timing influences sleep quality in patients with sleep disorders. *Sleep Medicine*, *71*, 8–17. https://doi.org/10.1016/j.sleep.2020.02.019

Rianti, K. I., Septadina, I. S., & Prananjaya, B. A. (2021). Holy Quran Recitation of Surah Al-Mulk and Al-Hasyr on Decreasing Anxiety In Medical Students. *International Journal of Islamic and Complementary Medicine*, *2*(1). https://doi.org/10.55116/IJIM.V1I1.1

Riera-Sampol, A., Rodas, L., Martínez, S., Moir, H. J., & Tauler, P. (2022). Caffeine intake among undergraduate students: sex differences, sources, motivations, and associations with smoking status and self-reported sleep quality. *nutrients*, *14*(8), 1661. https://doi.org/10.3390/nu14081661

Rosyidul'Ibad, M., & Napik, A. M. (2021). Effect of Al-Qur'an Therapy on Anxiety Cancer Patients in Aisyiah Islamic Hospital Malang, Indonesia. *Jurnal*

Keperawatan, *12*(2), 156-162. https://doi.org/10.22219/jk.v12i2.13774

Ruiz-Zaldibar, C., Gal-Iglesias, B., Azpeleta-Noriega, C., Ruiz-López, M., &; Pérez-Manchón, D. (2022). The Effect of a Sleep Intervention on Sleep Quality in Nursing Students: Study Protocol for a Randomized Kontrolled Trial. *International Journal of Environmental Research and Public Health*, *19*(21). https://doi.org/10.3390/ijerph192113886

Sejbuk, M., Mirończuk-Chodakowska, I., & Witkowska, A. M. (2022). Sleep quality: a narrative review on nutrition, stimulants, and physical activity as important factors. *Nutrients*, *14*(9), 1912. https://doi.org/10.3390/nu14091912

Sonang, S., Purba, A. T., &; Pardede, F. O. I. (2019). Grouping the number of population by age category by k-means method. *Journal of Tekinkom (Information and Computer Engineering*), 2*(2), 166-172.*

Sugiyono, (2017). *Quantitative, qualitative and R&D research methods*, Alfabeta Bandung

Sumaryani, S., &; Puspita Sari, P. I. (2015). Ar Rahman-Based Dysmenorrhea Gymnastic to Reduce Pain. *Journal of Ners*, *10*(2), 360–365.

Supriyanti, E. (2021). Penerapan terapi murottal al-quran untuk mengatasi insomnia pada lansia. *Jurnal Manajemen Asuhan Keperawatan*, *5*(1), 14-23. https://doi.org/10.33655/mak.v5i1.106

Tandon, A., Kaur, P., Dhir, A., & Mäntymäki, M. (2020). Sleepless due to social media? Investigating problematic sleep due to social media and social media sleep hygiene. *Computers in human behavior*, *113*, 106487. https://doi.org/10.1016/j.chb.2020.106487

Vargas, P. A., Flores, M., & Robles, E. (2014). Sleep quality and body mass index in college students: the role of sleep disturbances. *Journal of American college health: J of ACH*, *62*(8), 534–541. https://doi.org/10.1080/07448481.2014.933344

Vargas, P. A., Flores, M., & Robles, E. (2014). Sleep quality and body mass index in college students: the role of sleep disturbances. *Journal of American college health*, *62*(8), 534-541. https://doi.org/10.1080/07448481.2014.933344

Wang, F., &; Bíró, É. (2021). Determinants of sleep quality in college students: A literature review. *Explore*, *17*(2), 170–177. https://doi.org/10.1016/j.explore.2020.11.003

Zunhammer, M., Eichhammer, P., & Busch, V. (2014). Sleep quality during exam stress: the role of alcohol, caffeine and nicotine. *PloS one*, *9*(10), e109490. https://doi.org/10.1371/journal.pone.0109490