

The Effect of Keroncong Music Therapy on Reducing Agitation in the Elderly with Dementia

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ABSTRACT

Dementia naturally occurs along with the aging process, the thing that is most avoided from the symptoms of dementia is agitation. This condition causes feelings such as irritation or excessive anxiety. This can trigger a decline in intellectual capacity which is characterized by cognitive, emotional, and psychomotor disturbances. A continuous therapy with minimal side effects is required before the use of medical therapy which is known to be high in side effects. This study aims to analyze the effect of keroncong music therapy in reducing the level of agitation in the elderly with dementia. Elderlies with dementia using simple random sampling technique. The sample was divided into 29 treatment groups and 29 control groups. The statistical test used was Mann-Whitney. The treatment group was given keroncong music therapy at a dose of 15 minutes a day for 14 consecutive days. At the pre-test, there was no significant difference in agitation levels between the two groups ($p=0.748$), but at the post-test, a significant difference in agitation levels was found between the two groups ($p<0.05$). Keroncong music therapy can reduce the level of agitation in the elderly with dementia. Future researchers are expected to be able to conduct research by comparing the effectiveness of keroncong music therapy with other non-pharmacological interventions in reducing agitation levels.

I. Introduction

The aging process is unavoidable, runs continuously and continuously. Aging causes anatomical, physiological, and biochemical changes in the body, so that it will affect the function and ability of the body as a whole (Murphy et al., 2018). One of these changes is dementia which can cause agitation. Agitation is feelings such as irritation, irritation, or excessive agitation caused by a provocation or little or no provocation. This condition can be a sign of a medical or psychiatric condition, while dementia can be defined as a decline in intellectual capacity characterized by cognitive, emotional, and psychomotor disturbances (Lumbantobing, 2014). A study of 487 elderly by Bakker, Duivenvoorden, Lee, & Trijsburg (2015) in Nedherland, the psychological problems of elderly dementia include depression (43.9%), apathy (43.1%), anxiety (41.6%) and agitation (31.2%). As many as 31.2% of the elderly with dementia showed agitation which would increase from 33% to 50% in a 2 year period (Bartels et al., 2013).

The number of elderly people in 2025 is estimated to reach around 2 billion people worldwide. Currently the elderly with agitation due to dementia are estimated at 35.6 million people in the world and will double every 20 years to 65.7 million in 2030. The elderly group in Indonesia is estimated to increase to 21.4% in 2050 from 8.9% in 2013(Kemenkes RI, 2014).



As the elderly increase, there is no definite data regarding the number of agitated elderlies in Indonesia. Data that supports the number of elderly people who experience agitation in Indonesia is the prevalence of elderly agitation in Indonesia which was recorded at 62.5% in 2014. (Purnakarya, 2016). The 2018 Indonesian Health Profile states that the prevalence of agitation in the elderly in East Java is 57% (Kemenkes RI, 2018). Based on data from the Banyuwangi District Health Office, there are 860 elderly people with dementia who experience agitation. Based on a preliminary study conducted by researchers in December 2021 in the Work Area of the Tapanrejo Health Center, Banyuwangi Regency, it was found that there were 140 elderly people with dementia who experienced agitation. The results of researcher interviews with 5 families of elderly dementia sufferers who experience agitation show that the elderly is often restless, complain excessively, and often say words such as curses.

Agitation is a serious problem with high rates of morbidity and mortality (associated with metabolic disorders). The presence of accompanying symptoms that usually accompany these symptoms, such as delirium, worsens the patient's prognosis (Tsoi et al., 2017). Agitation also has an impact on the emergence of emotional disorders, psychology, treatment for families and health workers. Agitation in the elderly includes hitting, kicking, cursing, restlessness, complaining, negativism, and repeating sentences in conversation. As a result of agitation, the elderly experience an increased incidence of falls, delayed sleep onset, and nighttime sleep disturbances (Gerdner, 2010). Treatment of the elderly with agitation carried out abroad includes pharmacological and non-pharmacological. Pharmacological therapy using anxiolytic agents and antipsychotic drugs (Mitchell et al., 2015). The use of pharmacological therapy is considered detrimental because the elderly consume a lot of drugs for physical and psychological ailments that they suffer, so it is necessary to develop other therapies, namely non-pharmacological therapy. (Fitzsimmons et al., 2014). One of the non-pharmacological therapies used is music therapy (Craig, 2014). According to Gomez et al. (2017) in his research states that music therapy can reduce agitation in the elderly who is carried out regularly by using familiar music, while based on the results of interviews with the elderly in research locations conducted in December 2021, it is stated that 9 out of 10 elderly people are familiar with keroncong music.

Music therapy produces a stimulus that is sent from the vestibule to the axons of ascending sensory fibers and then to the neurons of the Reticular Activating System (RAS). The stimulus is then transmitted to the limbic system and integrates with the hypothalamus. The hypothalamus transmits stimuli to the reticular formation as a conduit of impulses to the autonomic fibers. The hypothalamus also sends a signal to the pituitary gland which is then received by the pituitary gland to increase the secretion of endorphins. Midbrain also releases Gamma aminobutyric acid (GABA), enkephalin, and beta endorphins as an ejector of the feeling of relaxation and calm that arises. (Tanaka et al., 2012). These substances provide an analgesic effect that can eliminate stress neurotransmitters in the somatic sensory centers of the brain and cause relaxation, so that agitation can be controlled. The mechanism of appropriate keroncong music therapy as a non-pharmacological intervention is expected to reduce agitation in the elderly effectively. Non-pharmacological therapies such as educational interventions are believed to be effective in improving a person's health status (Adiutama & Fauzi, 2020). Keroncong music was chosen because based on a preliminary study conducted on 20 elderly people in the Work Area of the Tapanrejo Health Center, Banyuwangi Regency, 18 of them said they were more comfortable listening to the keroncong music genre than other music genres.

Based on the above background, the authors are interested in conducting research on the effect of keroncong music therapy on reducing agitation in the elderly with dementia in the Tapanrejo Health Center Work Area, Banyuwangi Regency.

II. Methods

Quasy-experiment pre-post-test with control group were conducted on 58 elderly dementia with agitation. This research was conducted in the working area of the Tapanrejo Public Health Center, Banyuwangi Regency from August to September 2022. The sampling technique used was simple random sampling. In measuring agitation in the elderly, researchers used the Cohen Mansfield Agitation Inventory (CMAI) questionnaire sheet.(Mansfield, 2001). Previously, to find out the elderly with dementia, researchers used the Mini Mental State Examination (MMSE) questionnaire. While the instrument for the independent variable is music therapy, the researchers used music therapy SOPs adapted from Airlangga University, Surabaya (Hariyanto & Effendi, 2011).

Respondents who met the inclusion criteria were divided into two groups, the treatment group and the comparison group. The distribution of the groups was done randomly to avoid the risk of research bias. In addition, the researcher prepared a nurse in charge who had received direction from the researcher to help fill out a questionnaire (measure) pre and post agitation to be carried out for the elderly with dementia. Prior to the intervention, the researcher was assisted by the nurse in charge of measuring agitation using the Cohen Mansfield Agitation Inventory (CMAI) questionnaire by observing for 1 week to both groups.

At the time of the intervention, the researcher divided 2 groups of respondents on the same day, namely the treatment group and the comparison group. The treatment group was given keroncong music therapy intervention for 15 minutes once a day which was carried out 14 times in 14 consecutive days, while the comparison group was not given keroncong music therapy. Keroncong music therapy is given individually in turn in the morning assisted by elderly family members who have been given training to run SOPs. The comparison group will be given a keroncong music therapy intervention after filling out the post-test questionnaire in order to meet the legal ethical requirements of human health research. The next procedure, the researcher measured agitation after the intervention was given. All data is recorded in the assessment sheet that has been provided. The data collected was then coded and tabulated, to find out the difference between the results of the research before and after the intervention was given the Wilcoxon Signed Rank Test statistical test with a significance degree of 0.05. The next statistical test to determine the difference in agitation between the comparison group and the treatment group that had received keroncong music therapy was analyzed by the Mann Whitney U Test with a degree of significance 0.05.

III. Results and Discussion

Table 1 shows that most of the respondents in the treatment and control groups were 76 – 85 years old. Most of the sexes in the treatment and control groups were women, respectively 55.2% and 58.7%. The education level with the highest portion in both the treatment and control groups was SD, respectively, namely 41.3% and 44.8%. Furthermore, according to the different test using chi-square on each respondent's characteristic, it shows a p value > 0.05 which means that there is no significant difference in the characteristics between the two groups, so it can be said that the characteristics of the respondents in the two groups are equal.

Table 1 Socio-demographic Characteristics (n=58)

No	Socio-demographic	Group				p-value
		Treatment (n=29)		Control (n= 29)		
		N	%	n	%	
1	Age					0,076
	1) 76 - 85 y.o	24	82,7	22	75,8	
	2) 65 - 75 y.o	5	17,3	7	24,2	

2	Gender					0,725
	1) Male	13	44,8	12	41,3	
	2) Female	16	55,2	17	58,7	
3	Pendidikan					0,441
	1) Tidak Sekolah	8	27,5	7	24,2	
	2) SD	12	41,3	13	44,8	
	3) SMP	4	13,7	6	20,6	
	4) SMA	5	11,2	3	10,4	

Table 2 Agitation Levels in Elderly Dementia Before Keroncong Music Therapy

No	Tingkat Agitasi Pre-test	Kelompok			
		Perlakuan		Kontrol	
		N	%	n	%
1	Agitasi Ringan	8	27,5	9	31,1
2	Agitasi Sedang	11	37,9	10	34,4
3	Agitasi Berat	8	27,5	9	31,1
4	Agitasi Sangat Berat	2	5,1	1	3,4
	Total	29	100	29	100
	Uji Statistik <i>Mann-Withney</i>		p = 0,748		

Table 2 shows that both the treatment and control groups had the highest portion of moderate agitation, 37.9% and 34.4%, respectively. Only a small proportion of elderly with dementia experienced very severe agitation, 5.1% in the treatment group and 3.4% in the control group. Based on the Mann-Whitney statistical test, it was found that at the time of the pre-test there was no significant difference in the level of agitation between the two groups.

Table 2 Agitation Levels in Elderly Dementia After Keroncong Music Therapy

No	Tingkat Agitasi Post-test	Kelompok			
		Perlakuan		Kontrol	
		n	%	n	%
1	Agitasi Ringan	13	44,8	9	31,1
2	Agitasi Sedang	9	31,1	11	37,9
3	Agitasi Berat	7	24,1	8	27,5
4	Agitasi Sangat Berat	0	0	1	3,5
	Total	29	100	29	100
	Uji Statistik <i>Mann-Withney</i>		p = 0,008		

Based on table 2 it was found that the highest level of agitation in the treatment group was mild agitation (44.8%), while in the control group the highest level of agitation was moderate agitation (37.9%). In the treatment group after being given keroncong music therapy at a dose of 15 minutes a day for 14 consecutive days, no very severe agitation levels were found, but in the control group, 3.5% of elderly dementia were found to have very severe agitation levels. The Mann-Whitney difference test showed that after being given keroncong music therapy at a dose of 15 minutes a day for 14 consecutive days, there was a significant difference in agitation levels between the two groups ($p < 0.05$). So it can be said that keroncong music therapy can affect the level of agitation in the elderly with dementia.

The results showed that before keroncong music therapy was performed, both the treatment and control groups had the highest portion of moderate agitation, namely 37.9% and 34.4%, respectively. Only a small proportion of elderly with dementia experienced very severe agitation, in the treatment group 5.1% and 3.4% in the control group. Based on the Mann-Whitney statistical test, it was found that before the keroncong music therapy was performed there was no significant difference in the level of agitation between the two groups.

Almost half of the elderly with mild agitation in the treatment group (37.5%) were aged 65-75 and male, and a quarter (25%) had a junior high school education. Of all the elderly with moderate agitation in the treatment group, most (81.8%) were 76-85 years old, more than half (63.6%) were male, and almost half (44.5%) had elementary school education. Of all elderly with severe agitation in the treatment group, all aged 76-85 years, a quarter (25%) were male, and none had a high school education. Of all the elderly with very severe agitation in the treatment group, all aged 76-85 years and never attended school, half (50%) of those with very severe agitation were male. While in the control group, more than half of the elderly with mild agitation (55.5%) were 76-85 years old, most (66.7%) were female, and almost half (44.5%) had elementary school education. . Most of the elderly with moderate agitation (70%) are 76-85 years old, half (50%) are female and have elementary school education. Of all elderly with severe agitation, all aged 76-85 years, most (66.7%) are female, and more than half (55.5%) have elementary school education. Of all the elderly with very severe agitation, all are 76-85 years old, male, and not in school.

The results showed that the treatment group before being given keroncong music therapy all experienced agitation with the highest agitation value of 59, this value was included in the category of very severe agitation. According to Gerdner (2010), agitation can arise when the elderly experience excessive fatigue, environmental changes, changes in routines and roles, excessive external stimuli, and insufficient stimuli. According to the researcher, the symptoms of agitation that appeared in the respondents occurred due to changes in routines and roles. It is known that most respondents are aged 75-85 years, along with changes in age, all body organs experience a decline in function, so that at that time there is a change in roles and routines which also tend to decrease. This opinion is supported by Williams (2018) which states that in the theory of functional consequences the elderly experience a decline from positive functional consequences to negative functional consequences, the decline will occur more quickly when the age enters 75 years and over. It should also be noted that agitation can occur due to a stimulus that is too high or low, physical or psychological discomfort and an uncomfortable environment.

Based on the results of the study, it was found that after keroncong music therapy the highest level of agitation in the treatment group was mild agitation (44.8%), while in the control group the highest level of agitation was moderate agitation (37.9%). In the treatment group after being given keroncong music therapy at a dose of 15 minutes a day for 14 consecutive days, no very severe agitation levels were found, but in the control group, 3.5% of elderly dementia were found to have very severe agitation levels. After being given music therapy, the highest agitation value of the elderly in the treatment group at the time of the pre-test dropped to 44 (down 15 points), this value was included in the category of severe agitation which previously was very severe. This study also found that almost half of the respondents in the treatment group became mildly agitated after being given keroncong music therapy at a dose of 15 minutes once a day for 14 days. The results of this study are in line with research published in the Nursing Times Journal by Craig, J. (2014), the study states that music therapy affects the verbal behavior of the elderly which is one element of agitation. Another study that showed similar results was a study published in The American Journal of Geriatric Psychiatry by Bartels et al. (2013), the study showed that interactive and passive music interventions can reduce stress and increase relaxation in individuals with severe agitation.

In addition, this study also found several elderly in the treatment group whose agitation values remained at the time of the post test. Researchers argue that there are several factors that can affect the persistence of agitation in the elderly, one of which is age. According to Mitchell et al. (2015), the increase in cognitive impairment in an elderly is strongly influenced by increasing age. The older a person is, the higher the cognitive impairment that occurs. In addition, the elderly who experience agitation are caused by various things. First, it is caused by amyloid mutations that cause irreversible damage to brain tissue, the second is caused by tangling of neurofibrils, and third is caused by a decrease in acetylcholine and other neurotransmitters which are chemicals to send messages through the nervous system (Fitzsimmons, 2014).

According to the researcher, the respondents whose agitation level persisted had excessive psychological discomfort so that the provision of music therapy could only reduce the agitation value by 2 values. In addition, the respondent whose level of agitation persists is a closed person and difficult to study so that the cause of the psychological discomfort experienced is unknown. The results of the CMAI post test showed that the respondents continued to show repetitive behavior, namely cleaning the lice in the hair of the head. Even though the respondent's head hair is clean and there are no lice, besides that the respondent's family also says that the respondent often tells the exact same thing every day, namely stories about his youth.

To find out the differences between groups, a different test was carried out between the treatment and control groups using the Mann-Whitney statistical test, the results of the test showed that at the time of the pre-test there was no significant difference in agitation levels between the two groups ($p=0.748$), but after being given keroncong music therapy at a dose of 15 minutes a day for 14 consecutive days found a significant difference in agitation levels between the two groups ($p < 0.05$). So it can be said that keroncong music therapy can affect the level of agitation in the elderly with dementia.

Researchers believe that keroncong music therapy can stimulate the release of GABA and beta endorphine. It is expected that the elderly with agitation will experience an increase in GABA which will affect behavior and feel relaxed due to the ejection of beta endorphins so that agitation is reduced. This opinion is supported by Darlina (2008) which states that in general the stimulus from music is then transmitted by specific nuclei from the thalamus through the cerebral cortex, limbic system, corpus collosum and through areas of the autonomic system and neuroendocrine system. The limbic system will then integrate with the hypothalamus. The hypothalamus will transmit the stimulus to the reticular formation as a channel for impulses to the autonomic fibers, namely the sympathetic and parasympathetic nerves. In addition, as an ejector of the feeling of relaxation and calm that arises, the midbrain will also release Gamma Amino Butric Acid (GABA), enkephalin, and beta endorphine. These substances can cause analgesic effects that can eliminate stress neurotransmitters in the somatic center of the brain. Stimulation of endorphine secretion will affect mood and memory.

Keroncong music provides a great relaxing effect in various types of relaxation music. Especially when the melodious strains of the keroncong genre will naturally convey inner peace so that there is an optimal relaxation and distraction effect. The serene strains of the keroncong music genre are heard through the ears and will stimulate the target organs in the brain. This music interacts with various neural structures which further organize the interpretation of sound into the internal rhythm of hearing (Hariyanto & Effendi, 2011). In addition, the sound waves of music that are delivered to the brain in the form of electrical energy through the neural network will generate brain waves which are differentiated into alpha, beta, theta and delta frequencies. Alpha waves evoke relaxation, beta waves are associated with mental activity, theta waves are associated with stressful situations and creative endeavors, while delta waves

are associated with sleepiness (Tang et al., 2018). In contrast to other studies which state that to induce a sense of relaxation, counseling is needed (Adiutama, Hijriani, et al., 2021).

The sound of music heard can affect the frequency of the listener's brain waves. This mechanism is called FFR (Frequency Following Response) and occurs in the brain, precisely in the two superior olivary nuclei. FFR is defined as the adjustment of brain wave frequency in response to auditory stimuli and induces changes in overall brain wave and level of consciousness. These waves are the result of spontaneous feedback oscillations in the thalamocortical system. Changes in brain waves to alpha brain waves will cause an increase in serotonin. Serotonin is a neurotransmitter that is responsible for hunger and mood swings. Serotonin in the body is then converted into the hormone melatonin which has a regulatory effect on body relaxation which in turn causes mood changes (Craig, 2014). So that after being given keroncong music therapy, elderly people who experience agitation can feel relaxed and the value of agitation decreases. Interventions that are non-pharmacological in nature should indeed be further improved, considering that the implementation process is easy and inexpensive, but its effectiveness is relatively high (Adiutama, Fauzi, et al., 2021).

IV. Conclusion

Based on the results of the study, it was found that keroncong music therapy performed at a dose of 15 minutes a day for 14 consecutive days can reduce the level of agitation in the elderly with dementia in the Tapanrejo Community Health Center, Muncar District, Banyuwangi Regency. Future research can conduct research on music therapy by paying more attention to confounding variables such as stress, anxiety, and exercise. Keroncong music therapy can also be considered as additional material for practicum activities for students in dealing with mild and moderate agitation patients non-pharmacologically. The results of this study can also be used as additional data in the teaching and learning process, especially for Gerontic Nursing. Health workers at the Puskesmas can socialize and provide health education to clients by using independent nursing interventions in the form of keroncong music therapy to reduce agitation on elderly. Health workers at the Puskesmas can recommend its technique as a companion to pharmacological therapy because it can be done anywhere, anytime, and economical.

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