THE CORRELATION BETWEEN JAVANESE GAMELAN MUSIC THERAPY AND DEPRESSION SCORE IN ELDERLY NURSING HOME RESIDENTS

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ABSTRACT

Lansia yang tinggal di panti memiliki risiko tinggi untuk mengalami depresi. Musik yang umum didengarkan lansia di Provinsi Jawa adalah musik gamelan dan masih sedikit penelitian untuk membuktikan efek musik gamelan Jawa terhadap depresi lansia. Penelitian bertujuan untuk mengetahui pengaruh mendengarkan musik gamelan Jawa terhadap skor depresi pada lansia yang tinggal di panti. Penelitian menggunakan desain *quasi*-eksperimental dengan pendekatan *pre-test* dan *post-test* dengan kelompok kontrol. Peneliti menseleksi 88 lansia di salah satu panti wredha di DIY menggunakan GDS (*Geriatric Depression Scale*) dan mendapatkan 49 lansia mengalami depresi. Peneliti melakukan teknik *purposive sampling* (kriteria: berasal dari suku Jawa, tidak mengalami gangguan pendengaran, kooperatif, dan tidak sedang berada di ruang isolasi) sehingga diperoleh sampel sebanyak 26 lansia. Jumlah tersebut dibagi menjadi dua kelompok dengan proporsi usia yang sama antara kelompok intervensi dan kontrol. Uji Wilcoxon menunjukkan terjadi penurunan skor depresi pada kelompok intervensi (*p-value* 0,000). Sementara itu, skor depresi pada kelompok kontrol meningkat dari 7,46 menjadi 9,46. Musik gamelan Jawa terbukti efektif menurunkan skor depresi pada lansia di panti.

Kata Kunci: *Depresi, lansia, gamelan Jawa*

ABSTRAK

Elderly nursing home residents conceive a high risk of experiencing depression. The elderly in Java Province commonly listen to music in the form of Javanese gamelan and there were only a few studies conducted so far to examine its effect on cases of depression among the elderly. This study aims to assess the impact of listening to Javanese gamelan on the depression score of the elderly nursing home residents using quasi-experimental design with pretest-posttest control group approach. The researchers screened 88 elderly nursing home residents living in one of the nursing homes in Yogyakarta using GDS (Geriatric Depression Scale) and found 49 elderly residents with depression. Using purposive sampling technique, 26 subjects were then chosen as the study samples (criteria: Javanese, not experiencing any hearing loss, cooperative, not in an isolation room). The subjects were divided into two groups with the same proportion of ages in each group. Wilcoxon test indicated that there was a decreasing of the depression score in the intervention group (p-value 0.000). The depression score in the control group increased from 7.46 to 9.46. Javanese gamelan is proven to be effective in reducing the depression score in elderly nursing home residents.

Keywords: Depression, the elderly, Javanese gamelan

INTRODUCTION

The aging process can reduce the ability of the elderly to perform their daily activities. Not only cognitive derivation, emotional and social skills degradation can also occur in the elderly so they require special treatment from their family. When their family are no longer able to take care of the elderly, they will take the elderly to a nursing home (Silva et al., 2015).

Living in the nursing home is one of the crucial factors that may increase depression. The risk of depression on elderly living in nursing homes has been reported to be 3 to 4 times higher than the risk of the elderly living among the society (Ugur, Aktas, Orak, Saglambilen, & Avci, 2017). This condition happened because the activities in elderly nursing homes are usually not suitable to stimulate the capabilities of the elderly either physiologically, emotionally, or spiritually. Therefore, additional therapies on top of a standard therapy for the elderly in nursing homes are deemed necessary to improve their capabilities.

Based on previous studies, one of the therapy recommendations to reduce depression in the elderly living in nursing homes is music therapy. The type of music used in researches varies, ranging from classical music, instrumental to pop genre music (Silva et al., 2015; Torres, 2014; Ugur et al., 2017; Wang, Yu, & Chang, 2017; Werner, Wosch, & Gold, 2017). Music therapy has been internationally recognized as a nursing therapy. This statement is mentioned in Nursing Intervention Classification or NIC which is used by almost every nurse all over the world (Bulechek, Butcher, Dotcherman, & Wagner, 2013). By applying the principles of music therapy available in NIC, this research is expected to be able to provide an alternative for nursing intervention on the elderly living in nursing homes with higher risk of depression.

Hadi (2013) used a Pelog type, whereas this research used "Slendro Manyuro" type. Pelog and Slendro are two kinds of gamelan music. The music was played for the elderly in the nursing home. The researchers chose gamelan as a music therapy because the elderly in Java usually love to listen to gamelan due to its relaxing effect although they do not play the instruments themselves. The Slendro type was chosen because it has up-beat rhythm that can boost up the mood whereas the pelog type tent to have mellow and calm rhythm. By listening to tembang (traditional song of javanese) Slendro, it is expected that the elderly would have a positive mood that might help to decrease their depression score. In addition, this study can complement previous studies and enrich the types of Javanese gamelan that can be selected as music therapy for the elderly living in nursing homes. The purpose of this research was to examine the effect of Javanese gamelan on depression score among institutionalized elderly.

METHOD

This research was categorized as a quantitative study using quasi-experimental design with pretest-posttest control group approach. The population was 88 elderly nursing home residents in Tresna Wredha Budi Luhur, Kasongan, Bantul. The elderly were screened using Geriatric Depression Scale (GDS), and 49 residents had acquired >4 GDS score, which indicated that all of them are suffering from depression.

The sample was taken using a purposive sampling technique with criteria as follows: (1) Javanese, (2) not having a hearing loss, (3) cooperative, and (4) not currently consuming antidepressant medication. The second criteria were checked directly to the elderly by the researchers using whisper test. To obtain the data for the first, third, fourth and fifth criteria, the researcher asked the medical staffs in the nursing home. The elderly would be excluded as a respondent if they are currently being treated in isolation room, since the therapy cannot be conducted in such environment. Based on the sampling technique, the researchers obtained 26 respondents.

All subjects were divided into two groups: treatment group (13) and control group (13). Researcher divided the two groups based on the proportion of age groups. Each group consisted of 10 respondents in the age group of 60-74

years old (76.9%) and 3 elderly in the age group of 75 years old or more. Researcher tested the difference in pre-test depression scores to see if there were differences in depression scores before the treatment using Javanese gamelan music therapy.

Geriatric Depression Scale (GDS) was used to measure the depression score of the respondents. This research used short version of GDS consisting of 15 questions. The validity and reliability of this scale have been tested. The validity value of all items of GDS was > 0.361 while the reliability value was 0.907, so it can be concluded that the GDS scale can be used in this research. The Standard Operating Procedure (SOP) of music therapy in using Javanese gamelan has also been tested by experts in nursing (Parlina, 2016). Therefore, this SOP can be applied as the basis of implementation for the music therapy in this research. The implementation process of the therapy can be seen in Figure 1.

The therapy was conducted in calm and closed room. Javanese gamelan music was played to the respondents through headphones. By using headphones, it is expected that the stimulus of gamelan music sound will be directly received by the earlobes and delivered to eardrums then to the brain without any other sound stimuli. This method was performed to reduce the bias which may occur. This research used Javanese gamelan music with a title of Slendro Manyuro. This type of Gamelan music has mellow rhythm, authoritative tone, provides calmness and is intended for old age (Hadi, 2013). Therefore, researcher chose this type because it can boost the mood of the elderly.

Headphones were connected to a laptop installed with Javanese gamelan music soft files as well as music player software. The respondents were asked to lie on their back on their bed. The headphones were then plugged in attached to their ears. Next, the Javanese gamelan music was played and its volume was adjusted so it would not be too loud but can be heard clearly. Music frequency was set between 80 Hz - 120 Hz so it was comfortable to listen to. Researcher also confirmed to the respondents whether the volume was too loud or not. After getting the right music volume, researcher played Javanese gamelan music from the beginning to the end once for each respondent. The total duration of the Javanese gamelan music was 15 minutes. The therapy was carried out in the morning after breakfast. During the whole process, the respondents were accompanied and observed for their comfort. The therapy was carried out for 7 days (once a day) in a row for each respondent in the intervention group based on the SOP of Javanese Gamelan music therapy from Parlina (2016) which has been validated through an expert judgment.

This study was assisted by 4 assistants who had been trained to carry out Javanese Gamelan music therapy based on SOP so that in one day, this therapy could be conducted to all the respondents in the intervention group without interfering with their daily activities at the nursing home. The respondents of the control group did not get any intervention. Both the respondents in the control group and the intervention group were still advised to carry out their daily activities at the nursing home as per usual. A Mann Whitney test was performed to analyze the depression score difference between two groups before music therapy was held. A paired t-test was used to analyze the difference of depression scores between pretest and posttest in the control group since the data of depression score on pretest and posttest were distributed normally (p-value > 0.05). Meanwhile, for the intervention group, the difference of pretest and posttest depression scores was analyzed with Wilcoxon's test since posttest data were not distributed normally. This study has been conducted in hold principle of research ethics like anonymity, autonomy, veracity, beneficence, justice and informed consent. Ethical clearance letter was issued by the health research ethics commission no. 037.3/FIKES/PL/III/2019.
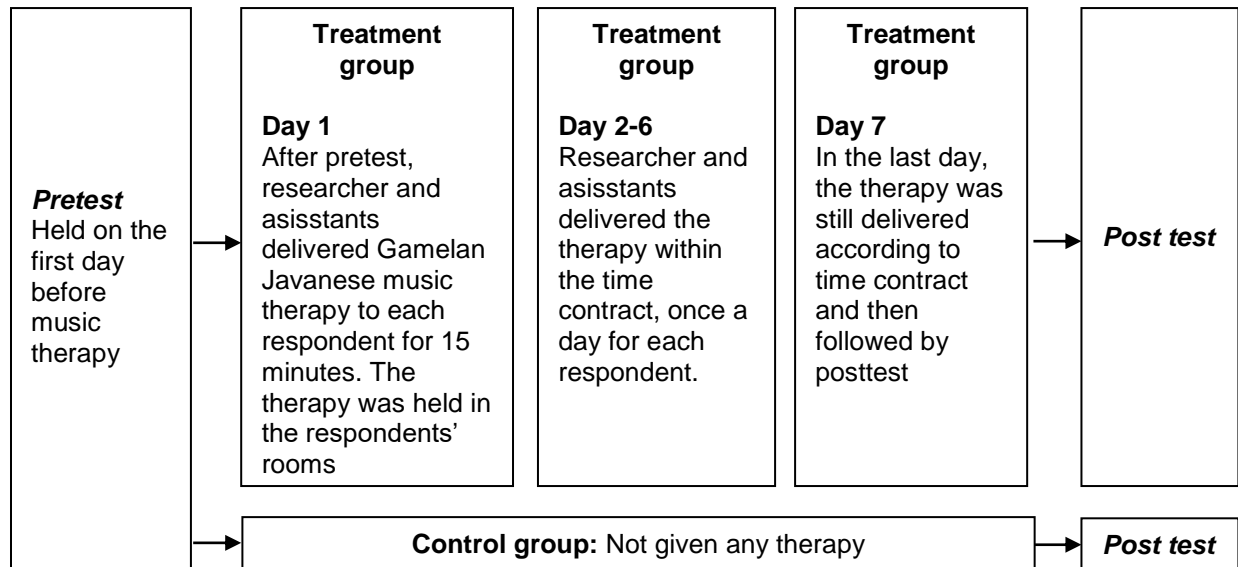
| *Pretest* Held on the first day before music therapy | **Treatment group** **Day 1** After pretest, researcher and asisstants delivered Gamelan Javanese music therapy to each respondent for 15 minutes. The therapy was held in the respondents' rooms | **Treatment group** **Day 2-6** Researcher and asisstants delivered the therapy within the time contract, once a day for each respondent. | **Treatment group** **Day 7** In the last day, the therapy was still delivered according to time contract and then followed by posttest | *Post test* |

| **Control group:** Not given any therapy | *Post test* |

Figure 1. Research Process

RESULT

Table 1 shows that among 26 respondents, most of them are in the elderly stage (76.9%) and dominated by female (92.3%). The analysis of sex difference between the two groups was performed through chi-square test with p-value 0.462 (>0.05) which shows that there was no difference in sex between the treatment and the control groups. The difference of age was also analyzed through Kolgomorov-Smirnov's test with p-value 0.196 (>0.05) which also proves that there was no difference in age between the control and treatment group (Table 1).

Table 1. Baseline characteristics of respondents

Characteristic	Intervention Group		Control Group		Characteristic Difference (p-value)
	n	**%**	**n**	**%**	
Age group					
60-74 (*Elderly*)	10	76,9	10	76,9	0.196
75-90 (*Old*)	2	15,4	3	23,1	
>90 (*Very old)*	1	7,7	0	0	
Gender					
Male	6	46,2	1	7,7	0.462
Female	7	53,8	12	92,3	

The difference of the depression score of the pretest on the control and treatment groups was analyzed using Mann-Whitney's test which resulted p-value 0.774 (Table 2). This result shows that there was no difference of the depression scores between the control and treatment groups before the music therapy was implemented by listening to Javanese gamelan. Thus, the condition of the two groups can be said to be the same, thereby reducing the bias of this study results.

Table 2. Pre-test score difference analyze between two groups

	Mean	**SD**	**P-value**
Intervention Group			
Pre-test	6.92	2,216	0.744
Control Group			
Pre-test	7.46	3,332	

The change of the depression scores can be seen in Table 3. After seven days of continuous therapy, the depression scores on the treatment group decreased by 3 points while the control group increased by 2 points. The difference between the pretest and posttest on the treatment group has been proved significant with 0.000 of p-value. This finding was substantiated by the difference analysis of the posttest depression scores between the control and treatment groups. Using Mann-Whitney's test, 0.000 of p-value has been acquired; thus, it can be concluded that there was a significant difference in the posttest depression scores between the control group and the treatment group (Table 4).

Table 3. Changes in depression score following interventions

Group	Mean	SD	Min-Max	Mean difference (CI 95%)	p-value
Intervention Group					
Pre-test score	6,92	2,216	5-12	-3.00	0.000
Post-test score	3,92	1,384	2-7		
Control Group					
Pre-test score	7,46	3,332	3-14	2.00	0,057
Post-test score	9,46	1,941	6-12		

Table 4. Post-test score difference analysis between two groups

	Mean	SD	P-value
Intervention Group			
Post-test	3.92	1,384	0.000
Control Group			
Post-test	9.46	1,941	

DISCUSSION

Depression is a common mental illness which manifested with loss of interest or pleasure, guilt or low self-esteem, insomnia, loss of appetite, lack of energy, and low level of concentration. Depression mostly occurs as the part of aging process and very common for the elderly. Depression is the most important health issue since it has been known to be often found on the elderly. It cannot be diagnosed and treated comprehensively. It is triggering the risk of suicide if left unhandled and negatively affecting the life quality of the elderly. Depression is more common to occur on the hospitalized or the institutionalized elderly. Depression can decrease the life satisfaction of the elderly so it can significantly decrease their life expectancy in turn. The highest suicide rate is owned by elderly (Kleisiaris et al., 2013; Ugur et al., 2017). It can be concluded that depression in the elderly can generate great impact on their quality of life. If it is not properly identified and treated, depression can generate adverse effects and might even cause the elderly to commit suicide.

In this research, women have higher risk of experiencing depression than men (Table 1). Elderly women have more severe depression compared to men due to the change in estrogen hormones. The decrease of estrogen is highly influential toward emotional balance. Besides, elderly women experience a higher reduction of self-confidence compared to men; thus, they seem to have more loss in self-confidence and experience interpersonal relationship disorder. This condition will become worse if they have issues within their families. Depression on elderly women can happen due to the excessive secretion of corticotrophin-releasing hormone as the hyperactivity result of hypothalamic-pituitary-adrenal axis (HPA-axis), which might stimulate the occurrence of depression (Livana, Susanti, Darwati, & Anggraeni, 2018).

The findings of this research indicated that there are no differences in sex and age between the control and treatment groups (Table 1) and there is no significant differences of pretests results on both groups in which the elderly

experience mild depression (Table 2). This condition indicated that the age and sex of the elderlies become the factors which stimulate the occurrence of depression. Biologically, elderly women have higher risk to experience depression, due to that matter; health workers should pay more attention toward the elderly women.

The incidence of depression in the elderly varies depending on their living location. The prevalence of depression on the elderly in primary health care amounted to 5-71%, and the depression on the elderly in the home treatment was 13.5%. The incidence of depression in the acute geriatric ward was 76.3% with the proportion of mild depression (44.1%), moderate depression (18%), severe depression (10.8%), and very severe depression (3.2%). The lowest incidence of depression was experienced by the elderly who live within the society along with their families, and the highest was experienced by the institutionalized elderly (Djaali & Sappaile, 2013).

This prevalence was supported by the findings of this research in which the pretest's result on the intervention group shows 6.92 of mean, while the control group shows 7.42 of mean (Table 2). By using GDS as the instrument, the elderly on both the intervention and treatment groups have mild depression before therapy was conducted. This condition shows that the institutionalized elderly are indeed the population with the highest risk of experiencing depression.

Eldercare or nursing home is deemed an inappropriate and indecent place for the elderly to fulfill their needs either physically, socially, or cognitively. The institution has lack of activities to suffice those needs. Another study found that the treatment result in the eldercare seems to be the cause of the elderly to progressively experience the process of the decreasing functional capacity. Thus, the treatment in eldercare could lead the elderly to gradually lose their abilities in conducting daily activities or self-care and eventually lose their autonomy and independence. If this condition continues, the institutionalized elderly could experience depression (Praesti, 2014; Silva et al., 2015).

The condition of treatment in nursing home can trigger the occurrence of depression in the elderly. Therefore, it is important to develop recreational, intellectual, social, and religious activities that are able to enhance the ability of the elderly in doing daily treatment, improve motivation and positive confidence as well as spiritual wellbeing. One of the activities that are recommended to achieve that purpose is music therapy. Music therapy using Javanese gamelan was selected in this research because the study was performed in Yogyakarta where, according to the short interview with the elderly nursing home residents, they love to hear the music produced from Javanese gamelan although they cannot play it themselves.

There are several studies which stated that music therapy can decrease the depression level of the elderly. The type of music used in researches varies, ranging from classical music, instrumental to pop music (Silva et al., 2015; Torres, 2014; Ugur et al., 2017; Wang et al., 2017; Werner et al., 2017). The results of this study are also consistent with a previous research which states that Javanese Gamelan music therapy can reduce depression in the elderly (Hadi, 2013). Hadi (2013) study used the Pelog type, while this study used the Javanese Gamelan Slendro Manyura type.

Music therapy is also a part of the international nursing actions stated in the Nursing Intervention Classification (NIC). In NIC, music therapy is defined as the use of music to help achieve specific changes in a person's behavior, emotions or physiology (Bulechek et al., 2013). Indonesia, which consists of various ethnicities, has their respective local music. Javanese Gamelan is highly well known especially in Central Java and Yogyakarta. In this study, researcher used the Javanese gamelan Slendro Manyuro type because the study took place in a nursing home in Yogyakarta. In addition, this type was chosen because it has mellow rhythm and was indeed invented to be listened to by the elderly.

Slendro Manyuro Javanese gamelan music with slow tempo can make the elderly more relax (Hadi, 2013). Slow

tempo in this type of Javanese Gamelan can stimulate the alpha wave in the brain which is able to cause relaxation effect so it can reduce the depressive feeling. There would be a decreasing level of Adrenal Corticotropin Hormone (ACTH) when someone is listening to music, thus, the relaxing, pleasuring, and peaceful feeling will occur, and it also helps reducing anxiety and stress. These results emerge because music therapy can stimulate the release of endorphin in the body (Sarafino & Smith, 2012; Ugur et al., 2017; Murdhiono, Damayanti, & Ayunia, 2019).

The Javanese gamelan music was delivered through headphones. This way, the music can be directly received by the ears and delivered to the brain without the stimulus of other voices that might disrupt the sensing process. This condition caused the mean of the depression score of the intervention group to experience a 3 point decrease (Table 3). This finding substantiated the results of the previous studies in which a music therapy given 3 times a week (30 minutes minimum for each therapy) can significantly reduce the depression score on the elderly (Silva et al., 2015; Ugur et al., 2017). In this research, Javanese gamelan music therapy was performed for 15 minutes every day for 7 days in a row. With this sole duration and frequency, the depression score of the elderly can decrease as long as the treatment is in accordance to the principles stated in NIC.

The decrease of the depression score might also occur due to the type of the music. This research used Javanese gamelan music of "Slendro Manyuro" type. This type has slow tempo, so it has a calming effect and makes the elderly feel more comfortable and relax. A slow-tempo Javanese gamelan is usually has the same music rhythm with Mozart's which has 60 beats per minute (Hadi, 2013). With a slow tempo, a classical music (which in this research was Javanese gamelan of "Slendro Manyura" type) has the most positive effect compared to other genres. Listening to a fast-tempo music can increase blood pressure. On the contrary, listening to a slow-tempo music will generate a reverse effect to the body (Lucas, 2019). Therefore, listening to

Javanese gamelan has the same effect with classical music. This condition can be seen in Table 3 in which the depression scores on the intervention group are decreasing significantly (0.000 of p-value).

In Table 4, it can be seen that there was a significant difference on the depression scores of posttests between the control and treatment groups. The control group which did not receive music therapy only did routine activities based on the programs available in the institution. This condition actually made the posttest scores to experience a 2 point increase. This finding is supported by the previous studies stating that the institutionalized elderly have a higher risk to experience depression due to lack of activities that can stimulate their abilities (Kleisiaris et al., 2013; Ugur et al., 2017). In contrast, the respondents in the treatment group are not only motivated to carry out their routine activities, but also get Javanese Gamelan music therapy which can ultimately reduce their depression scores significantly.

Thus, Javanese gamelan music therapy can be incorporated into the standard of care for the elderly in nursing homes. This therapy can be done primarily by nurses (because it is one of the nursing actions at the NIC), but it can also be done by other health workers given its simple procedures and lack of health workers in nursing homes in Indonesia. Therapists can use a laptop or other music players (for example mobile phones) and headphones so that the music therapy can take place optimally. For nursing homes outside of Java, therapists can adjust the type of music selected for music therapy according to the uniqueness of their respective regions as long as the music of the region has a slow tempo, soft and soothing for the elderly.

The limitation of this study was that the research was only conducted in one nursing home in Yogyakarta so that the number of respondents was limited to only 26. In addition, this therapy cannot be done to all the elderly due to some restrictive conditions where the elderly suffer from hearing loss.

CONCLUSION AND RECOMMENDATION

It can be concluded that listening to the Javanese gamelan as a music therapy could decrease depression score in the elderly nursing home residents. This therapy can be incorporated into the standard care system in institutional care for the elderly. Future researches are also expected in order to increase the number of respondents and research locations so a greater impact from Javanese gamelan music therapy can be seen.

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