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Effectiveness of Brainwave Music Therapy in Hypertensive Elderly with Sleep Disorders

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ABSTRACT

Elderly people who experience sleep disorders are at risk of various health problems, including hypertension. To treat insomnia comprehensively, an approach that not only relies on medication is needed, but also complementary therapies, one of which is brainwave music therapy. This music therapy can stimulate the brain to follow the vibrations and rhythms of music when individuals are resting, so as to bring them into a relaxed state and make it easier to fall asleep. This study aims to analyze the effect of brainwave music therapy on the level of insomnia in elderly hypertension. The research design used a descriptive case study approach involving two hypertensive elderly subjects who experienced sleep disorders. Music therapy was performed six times with a duration of 10-15 minutes. Data were collected through insomnia scale and observation. The results showed a decrease in the level of insomnia in both subjects after undergoing brainwave music therapy. Subjects who initially experienced severe insomnia decreased to mild insomnia. This indicates that brainwave music therapy has the potential to be an effective non-pharmacological intervention in reducing insomnia symptoms in hypertensive elderly.

Keywords: brainwave music therapy; case study; hypertensive elderly; insomnia

Background

The aging process can lead to a variety of problems that impact physical, biological, mental and socioeconomic health [(1)]. These problems have the potential to cause overall health problems in the elderly, which are often caused by degenerative processes. One important aspect in improving the health of the elderly is maintaining sleep quality, which is indispensable for the recovery of body functions to remain optimal [(2)].

According to WHO (2022), the elderly population in Indonesia is expected to increase at a higher rate than the elderly population in the world after 2100. The increase in the elderly population in Indonesia started in 2013, with a proportion of 8.9% in Indonesia and 13.4% in the world. It is estimated that this figure will increase to 21.4% in Indonesia and 25.3% in the world by 2050, and reach 41% in Indonesia and 35.1% in the world by 2100. In 2010, the number of elderly people in Indonesia was recorded at 23,992,553 people (9.77%), which increased to 28,283,000 people (11.34%) in 2015. In East Java Province alone, there are around 4,202,988 elderly people (11.12%). This increase is due to the increase in life expectancy which affects the number of elderly population from year to year. Indonesia has been categorised as an old-structure country since 2000, when the percentage of the elderly population exceeded 7% [(3)].

Elderly people who experience sleep disturbances are at risk of various health problems, including hypertension [(4)]. The relationship between hypertension and sleep disorders such as insomnia is caused by sympathetic activity in blood vessels, which can result in insignificant changes in cardiac output at night [(5)]. This condition has the potential to cause poor sleep quality. To treat insomnia comprehensively, an approach is needed that does not only rely on drugs, but also complementary therapies [(6)]. Some methods that can be developed include training the elderly to relax their minds before bed through relaxation therapy, aromatherapy, reading, or music therapy, including music therapy with brainwave [(7)]. This music therapy can stimulate the brain to follow the vibrations and rhythms of music when individuals are in a resting state, so that it can bring them into a relaxed state and make it easier to fall asleep [(8)].

A study by Sunaringtyas showed that music therapy with brainwave can reduce the level of insomnia, with the rate of severe insomnia reduced from 67% to 33% for mild insomnia. This study found a positive effect of music therapy using the sound of running water with brainwave on insomnia in the elderly in the Posyandu Sedap Malam

Pare area, Kediri [9]. Based on preliminary studies conducted at Puskesmas Arjuno, it was found that out of 205 elderly people with hypertension, 69 people were male and 136 were female. From the results of the interview, 13 hypertensive patients were identified, of which 7 of them experienced sleep disorders in the form of insomnia, which was characterised by difficulty starting sleep, changes in sleep patterns, wakefulness at night, daytime drowsiness, and feeling uncomfortable while sleeping.

Methods

This research design uses a descriptive case study approach involving two research subjects according to predetermined inclusion and exclusion criteria. The research subjects consisted of two hypertensive elderly people who experienced sleep disorders and were in the working area of Puskesmas Arjuno Malang City. Music therapy is carried out six times a week with moderate volume and duration between 10 to 15 minutes.

The instruments used in this study include interview sheets and observation sheets, as well as the KSPBJ Insomnia Rating Scale to record changes in insomnia levels before and after brainwave music therapy. This scale consists of 11 questions which include three questions about the stages of sleep, four questions about the impact of insomnia, and four questions about signs and symptoms. The measurement results can be categorised into several levels of insomnia, ranging from no sleep disturbance (score 11-19), mild insomnia (score 20-27), severe insomnia (score 28-36), to very severe insomnia (score 37-44). The total score of the subjects ranged from 11 (lowest) to 44 (highest).

Results

Insomnia Scale before music therapy with Brainwave

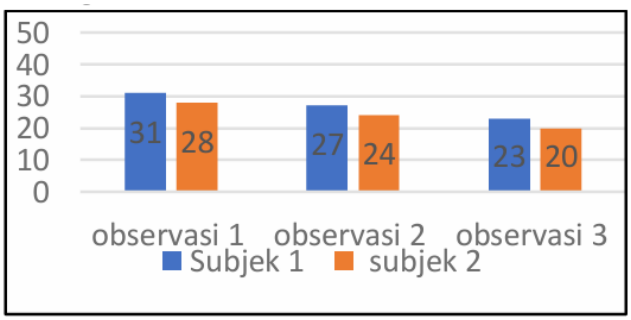
Before the music therapy was implemented, the insomnia scale showed that both subjects had scores indicating severe insomnia, with subject 1 scoring 35 and subject 2 scoring 31. Both reported similar complaints, but the cause of insomnia in subject 1 was frequent nightmares, which made him feel uncomfortable while sleeping. Meanwhile, subject 2 had difficulty sleeping due to his habit of consuming coffee and smoking every day, including before bed.

Application of Brainwave Music Therapy in Hypertensive Elderly with Insomnia

Both subjects followed the standard operating procedure (SOP) of music therapy. In subject 1, on the first day, he was not able to position himself comfortably, so on the second day, when the music therapy took place, he asked to move because he felt unable to concentrate. Meanwhile, subject 2 on the fifth day stated that music therapy helped him sleep better, especially after he started to reduce his habit of consuming coffee and smoking before going to bed. Both felt that music therapy helped them achieve a state of rest and relaxation, so they felt more relaxed.

Insomnia Scale After Music Therapy with Brainwave

The insomnia scale after the application of music therapy is displayed in the following graph:



Graph 1: Observation results after music therapy with brainwave on subject 1 and subject 2.

Based on graph 1, in the first observation, subject 1 obtained a score of 31, while subject 2 received a

lower score of 28, both of which were still included in the severe insomnia category. In the second observation, there was a decrease in the level of insomnia in subject 1 with a score of 27, while subject 2 recorded a score of 24, both of which were now included in the mild insomnia category. In the third observation, both subjects were in the mild insomnia category with a score of first subject 23 and the second subject 20. Both felt easier to fall asleep and felt comfortable and satisfied with their sleep. This decrease was supported by subject 1's efforts in controlling feelings of restlessness and anxiety, while subject 2 reduced coffee consumption and smoking before bed.

Discussion

Insomnia Scale before music therapy with Brainwave

Before the music therapy, the insomnia scale measurement showed that Subject 1 had a score of 35, while Subject 2 had a score of 31. Both can be classified as severe insomnia sufferers. From the results of the interviews conducted, it was revealed that Subject 1 had experienced insomnia disorder for approximately one month, while Subject 2 experienced the disorder for about two weeks. The main complaint of both is the difficulty in managing and maintaining sleep properly. This is in line with the statement of Huda, M (2020), which states that in severe insomnia, a person begins to show an inability to sleep well in more than one week but less than one month. Researchers argue that severe insomnia in the elderly can result in unmet sleep needs, which is in line with Widiyono's (2023) opinion regarding sleep disorders that tend to be experienced by the elderly.

The age factor is also the main cause of insomnia in both subjects. Subject 1 is 67 years old and Subject 2 is 69 years old, which falls into the elderly category (60-70 years old). Rafknowledge's (2017) statement supports this fact, which states that insomnia often occurs in individuals aged 60 years and over. Researchers note that as people age, physical health is also often compromised, such as in elderly people with hypertension who report poor sleep quality and less sleep duration compared to healthy elderly people. Data from the Ministry of Health (2022) shows that the incidence of insomnia or sleep disorders increases with age.

Subject 1 experienced stress and anxiety due to frequent nightmares about his son who died three months ago in an accident. This experience made Subject 1 feel that his sleep was disturbed. This is in line with Rafknowledge's (2017) statement that stress and anxiety are factors that cause insomnia, characterized by deep anxiety caused by thoughts about the problems at hand [(10)]. Researchers argue that many cases of insomnia are triggered by stress and anxiety, in accordance with Widiyono's (2023) statement that stress can induce bodily reactions in the brain and nervous system, thereby increasing alertness which ultimately makes it difficult for someone to sleep at night.

Lifestyle habits, such as consuming coffee and smoking, also affect a person's sleep quality [(11)]. Subject 2 has a habit of consuming coffee and smoking, with a frequency of smoking 5-6 cigarettes per day and consuming four cups of medium coffee. This is in line with Rafknowledge's (2017) theory, which states that caffeine and nicotine consumption are stimulating substances that can disrupt sleep patterns. Researchers noted that individuals who have a habit of smoking and consuming coffee are more prone to insomnia compared to individuals who do not have these habits. This finding is in line with the results of research by Prakoso, B (2020), which shows that the smoker group is more prone to insomnia.

Application of Brainwave Music Therapy in Hypertensive Elderly with Insomnia

The implementation of music therapy on both subjects was carried out in accordance with standard operating procedures (SOP) and showed a decrease in the level of insomnia. Both subjects felt more relaxed, comfortable, and reported that their sleep quality began to improve after undergoing this therapy.

Researchers noted that music therapy with brainwave given six times a week with a duration of 10-15 minutes was able to create a relaxed state that helped both subjects to fall asleep better. This is in line with previous research which states that the implementation of music therapy with moderate volume intensity and a duration of 10-15 minutes for six sessions can help improve sleep disorders and improve emotional, physical, psychological, and overall health conditions [(12)].

1. Insomnia Scale After Music Therapy with Brainwave

After being given music therapy, there was a change in the level of insomnia experienced by the subject, as seen from the decrease in insomnia score in subject 1 to 23. This supports the results of previous research which shows that music therapy is quite effective in reducing insomnia disorders, as evidenced by changes in observation

results before and after music therapy is performed [13].

The researcher noted that although the subject's insomnia level showed a decrease after music therapy, the change was not very significant. This is in accordance with the opinion of Geraldina (2017), which states that music therapy is a form of holistic therapy that directly targets the symptoms of the disease, but success depends entirely on the condition of each patient [14].

Conclusions and Recommendations

Before being given music therapy with brainwave, subject 1 and subject 2 both experienced severe insomnia caused by stress, anxiety and the habit of consuming coffee and smoking before bed. After undergoing music therapy with brainwave according to the SOP, there was a decrease in the level of insomnia. Subjects said that they felt more relaxed, comfortable, and slept better. It is hoped that in the future the implementation of music therapy with brainwave will become part of non-pharmacological nursing care for elderly people with hypertension who experience sleep disorders. Future researchers can involve families in monitoring the subject's activities before bed to obtain more comprehensive data.

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