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Original Article

The Effect of Brandt Daroff Exercise on the Balance of Vertigo Patients in the Cut Meutia Room of TK II Iskandar Muda Hospital Banda Aceh

Sunita[1]*, Riyan Mulfianda[2], Nanda Desreza[3]

[1-3]Nursing Science Study Program, Faculty of Health Sciences, Universitas Abulyatama, Aceh, 23372, Indonesia
Email: [1)] ssunitaa466@gmail.com, [2)] ryanmulfianda@abulyatama.ac.id,
[3)] nandadesreza.psik@abulyatama.ac.id

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Abstract

Vertigo is a disorder of balance against gravity with symptoms of dizziness, spinning like floating, the world seems to turn upside down. Vertigo can be brief or prolonged, lasting for hours or days. Complaints of vertigo come suddenly and are felt continuously until the patient cannot sleep. The Brandt-Daroff exercise is a treatment for vertigo that helps speed up recovery, prevent future episodes, and improve balance without needing medication. This vertigo exercise increases blood flow to the brain, allowing the body's balancing mechanism to operate better and the sensory system to do its job more efficiently. The goal of this study was to see how brandt daroff exercise affected the balance of vertigo patients at the Cut Meutia Room at Tk II Iskandar Muda Hospital in Banda Aceh. This type of research is a quasy experiment method with a one group pretest and postest design approach, this research was conducted in January-July 2024. The population and sample were all vertigo patients totaling 43 people and the sampling method used total sampling technique. Data collection using observation sheets and questionnaires. This study's data analysis methods include univariate and bivariate analysis, as well as statistical testing with the Wilcoxon signed rank test. The results of the study; there is an effect of brandt daroff exercise on the balance of vertigo patients with p-value = 0.007. As a recommendation, Tk II Iskandar Muda Hospital is encouraged to provide training for nurses on the importance of Brandt-Daroff exercises to help alleviate vertigo symptoms in patients.

Keywords: Brandt Daroff, Body Balance, Dizziness Therapy, Vertigo, Wilcoxon Signed-Rank Test.

1. Introduction

The number of non-communicable diseases continues to increase and vertigo is one of them. Complaints of balance disorders and vertigo are common complaints of patients who come for treatment (Putra & Adrian, 2019). World Health of Organization (WHO) in 2020, the incidence of vertigo in France is 48%, and the United States is 30% occurring in the age of 18-79 years where 24% is caused by vestibular disorders. Peripheral vertigo that occurs in the United States is more prevalent in women (Sumarliyah & Saputro, 2019).

According to the latest data from the Global Survey in 2021 showed 7.4% incidence of vertigo globally and per year reached 1.4%. The prevalence of vertigo in Germany due to vestibular dysfunction is around 35% of the population aged ≥ 40 years. In patients with vestibular vertigo, 75% have peripheral vertigo and 25% have central vertigo. Generally, vertigo is found in 15% of the overall population and only 4-7% are seen by a doctor (Triyanti et al., 2018).

Based on worldometers data, the number of vertigo cases in the world in 2017 was 50% and occurred at the age of 75 years with the most common complaint of headache. The incidence rate in America, vestibular dysfunction is about 35% of the population aged 40 years and above. Meanwhile, vertigo cases are mostly benign paroxysmal positional vertigo (BPPV) in the world reaching 64/100,000 which mostly involves the unilateral posterior semicircular canal (Priyono & Nusadewiarti, 2020).

The Ministry of Health reported that vertigo cases in Indonesia occur mostly in the age of 40-50 years as much as 50% is the third most common complaint by patients who come to general practice, after headache and stroke (Kemenkes RI, 2018). According to research conducted at one of the hospitals in Indonesia in 2019 showed vertigo affects all age groups, 20% in patients aged > 25 years, 30% in patients aged > 40 years, and 50% in the population aged > 65 years (Atia, 2018).

Vertigo is the misperception of movement of a person/environment (Yu & Li, 2018). Vertigo is typically accompanied by nausea and loss of balance that lasts only a few minutes or can last for several hours or even days (Huppert & Brandt, 2018). Complaints of vertigo come suddenly and are felt continuously until unable to sleep. Patients feel that the environment around them is spinning (de Joode et al., 2020). Patients believe that shifting positions from sleeping to waking worsens their issue and that shutting their eyes helps them feel better (Sjahrir, 2008).

The management of vertigo depends on the duration of complaints and discomfort due to the presenting symptoms and the underlying pathology. Specific measures may be recommended to reduce vertigo complaints. The main goal of vertigo therapy is to achieve optimal quality of life according to the course of the disease, by eliminating or reducing the sensation of vertigo with minimal side effects of drugs (Turana et al., 2007).

Brandt-Daroff exercise is a type of physical therapy or vestibular exercise used to treat vestibular diseases including vertigo. Brandt Daroff exercise has the benefit of speeding up vertigo recovery and preventing recurrence without the need for medication. The goal of this exercise is to prepare the patient for balance issues. Brandt daroff exercise is done 4 sets/day (morning, afternoon, evening and night) for 4 days (Bahrudin, 2013).

The Brandt Daroff exercise technique is a vertigo rehabilitation approach that may be done at home, as opposed to other exercise methods that require supervision from a doctor or medical personnel. When the vertigo side is unclear, the Brandt-Daroff exercise approach is utilized. This vertigo exercise increases blood flow to the brain, improves bodily equilibrium, and maximizes the activity of the sensory system (Herlina & Ibrahim, 2018). The role of nurses in vertigo patients in overcoming their body balance can be done brandt daroff exercise to improve body balance, so that patients can carry out daily activities better (Indarwati, 2018).

Based on the results obtained from Hanafia (2020), the results obtained before being given brandt darrof therapy which experienced a moderate level of vertigo symptoms as many as 20 people (66.7%), severe vertigo 9 people (30.0%), and mild vertigo symptoms as many as 1 person (3.3%). After being given brandt darrof therapy, 16 people (53.3%) experienced mild vertigo and 14 people (46.7%) experienced moderate vertigo. Statistics show p-value = 0.000. This means that brandt daroff therapy has a significant effect on reducing the level of vertigo symptoms.

According to previous research by Khoddafi et al. (2022), it was found that before the brandt daroff technique the pain scale was 7 and after the brandt daroff technique the pain scale was 4. Brandt daroff exercise approximately 3 times a day for 4 days can improve blood circulation, reduce balance disorders and accelerate recovery. Statistics show that there is a

difference between before and after being given the brandt daroff technique with a p-value = 0.001 or < α 0.05.

Based on data from the medical records of Cut Meutia Room, Tk II Iskandar Muda Hospital Banda Aceh, the number of patients with a diagnosis of vertigo in January-December 2023 was 103 people. Of these, only 43 patients were admitted to the Cut Meutia Room and had been in and out of the hospital frequently, while the other 60 patients only re-controlled at the polyclinic of Tk II Iskandar Muda Hospital. Patients said that since suffering from vertigo their lives were less productive and could not carry out daily activities.

Based on the results of observations and interviews conducted by researchers on 10 patients suffering from vertigo, it was found that 4 patients complained of spinning dizziness, nausea and vomiting when vertigo appeared. While the other 6 patients said that every time vertigo recurs, they will feel severe nausea and vomiting, the body feels weak and weak, both legs tremble when standing, unable to see bright lights and feel like the world is upside down. These data show that there are several problems that arise, where most patients suffering from vertigo do not know about therapies to reduce vertigo symptoms, rarely do brandt daroff exercises and they claim to only drink warm water and take anti-emetic drugs to reduce vertigo symptoms. Patients said they did not know the benefits and techniques of brandt daroff exercise that can improve blood circulation, accelerate recovery and reduce balance disorders in patients with vertigo. Patients also did not know the movements of brandt daroff physical therapy that are useful to reduce the incidence of vertigo.

Based on the above phenomenon, the researcher is interested in conducting research on the effect of brandt daroff exercise on the balance of vertigo patients in Cut Meutia Room, Tk II Iskandar Muda Hospital, Banda Aceh.

2. Literature Review

2.1. Concept of Brandt Daroff Exercise

Brandt Daroff exercise is a form of physical therapy or vestibular physical exercise to treat vesibular disorders such as vertigo (Triyanti et al., 2018). Brandt daroff exercise is an exercise that aims to adapt the elderly to the increased gravitational response to cause dizziness when there is a change in head position. Brandt daroff exercise performed according to the correct dosage will reduce and even eliminate vertigo symptoms in the long term (Farida et al., 2017).

Brandt Daroff exercise is a vertigo rehabilitation treatment that may be done at home, as opposed to other procedures that require supervision from a doctor or medical personnel. When the cause of vertigo is unclear, the Brandt-Daroff exercise approach is typically performed. This vertigo exercise increases blood flow to the brain, so improving the operation of the body's balancing mechanism and maximizing the functioning of the medical sensory system (Herlina & Ibrahim, 2018).

2.2. Concept of Balance

Balance is a person's perception of the environment that is regulated by the vestibular system. The vestibular system is the system responsible for the orientation of the body in the room, both when sitting, standing, and in other positions. The vestibular system is useful for maintaining one's body balance because there is a system that regulates how the body should be positioned based on the movement and position of the head, or neck. In addition, the vestibular system is also useful for maintaining balance, coordination and controlling body

movements. This system works together with the visual system, sensory system and motor system (Fransisca, 2013).

Balance disorders are one of the disorders that are often felt by all ages, even though the disturbance is still mild, the patient will immediately seek treatment because of the discomfort in the ear and has also interfered with daily activities (Soepardi et al., 2017).

2.3. Concept of Vertigo

Vertigo is a disturbance of balance against gravity with symptoms of dizziness, spinning as if floating, nausea, vomiting and cold sweating when changing head position (de Joode et al., 2020). This situation causes disruption of orientation or balance of the body to a room that makes the patient feel moving or spinning. Age is one of the risk factors for peripheral vertigo (Herlina & Ibrahim, 2018).

Vertigo is a subtype of dizziness (as an illusion of movement) or the feeling and sensation of the body spinning against the environment or vice versa (de Joode et al., 2020; Yu & Li, 2018). Vertigo is not a sickness, but a collection of symptoms or syndromes caused by balance abnormalities in the vestibular system or diseases in the central nervous system (Setiawati & Susianti, 2016).

3. Methods

This type of research is a Quasy Experiment / pseudo experimental method without a control group using the One Group Pretest and Postest Design approach. In this study, the sampling technique used was total sampling technique. This research was conducted in January-July 2024 with 43 patients as respondents. Data were obtained through questions distributed in the form of questionnaires and observation sheets. After that the collected data was analyzed to find the relationship between the independent variable and the dependent variable using the Wilcoxon test.

4. Results and Discussion

4.1. Research Results

4.1.1. Brief Profile of Respondents

Respondents in this study were vertigo patients who were treated in Cut Meutia Room, Tk II Iskandar Muda Hospital, Banda Aceh. The number of respondents was 43 patients with data distribution:

Table 1. Frequency Distribution of Vertigo Patient Balance Pre (Before Treatment) Brandt Daroff Exercise

No	Balance of Vertigo Patient Pre	Frequency (f)	Percentage (%)
1	Mild Vertigo	15	34,9
2	Moderate Vertigo	23	53,5
3	Severe Vertigo	5	11,6
Total		**43**	**100**

Based on table 1, it shows that the balance/vertigo disorder felt by patients before treatment or before being given brandt daroff exercise, most of the respondents experienced moderate vertigo, namely 23 people (53.5%).

4.1.2. Frequency Distribution of Vertigo Patient

Table 2. Frequency Distribution of Vertigo Patient Balance Post (After Treatment) Brandt Daroff Exercise

No	Balance of Vertigo Patient Pre	Frequency (f)	Percentage (%)
1	Mild Vertigo	28	65,1
2	Moderate Vertigo	13	30,2
3	Severe Vertigo	2	4,7
Total		43	100

Based on table 2, it shows that after treatment or after brandt daroff exercise, most of the respondents experienced mild vertigo, namely 28 people (65.1%).

4.1.3. Effect of Brandt Daroff Exercise

Table 3. Effect of Brandt Daroff Exercise on Balance of Vertigo Patients Results

Brandt Daroff Exercise	Balance of Vertigo Patient Pre						Total		α	P-Value
	Mild Vertigo		Moderate Vertigo		Severe Vertigo					
	∑	%	∑	%	∑	%				
Before	15	34,9	23	53,5	5	11,6	43	100%	0,05	0.007
After	28	65,1	13	30,2	2	4,7	43	100%		

Based on table 3 shows that there is a change in the number of respondents (patients) before treatment in the form of brandt daroff exercise most of them experienced moderate balance / vertigo disorders, namely 23 people (53.5%), while the number of respondents (patients) after treatment in the form of brandt daroff exercise most of them experienced mild balance / vertigo disorders, namely 28 people (65.1%). The results of this study are reinforced by the results of the difference through the Wilcoxon difference test value obtained p-value = 0.007 <0.05, which means it has a very meaningful or very significant difference in value (Hidayah et al., 2022).

Based on the balance value of pre vertigo patients (before treatment) and the balance of post vertigo patients (after treatment) brandt daroff exercise in patients it is known that before brandt daroff exercise, most respondents experienced moderate balance / vertigo disorders, while after brandt daroff exercise most respondents only experienced mild balance / vertigo disorders so it can be concluded that there is an effect of brandt daroff exercise on the balance of vertigo patients in Cut Meutia Room Tk II Iskandar Muda Hospital Banda Aceh Year 2024.

Diseases that attack the body's balance system are called vertigo and balance disorders are symptoms that are often complained of by people with vertigo. Vertigo can be caused by several symptoms such as dizziness due to a disturbance in the body's balance apparatus resulting in a mismatch between the actual position of the body with what is perceived by the central nervous system. In addition, the cause of vertigo occurs due to environmental conditions, drugs, circulation disorders, ear disorders and neurological disorders (Sjahrir, 2008).

The impact if vertigo is not addressed quickly will adversely affect the patient, people who experience vertigo will become less enthusiastic in their activities, dizziness and pain can make physical mobility and activities limited. Treatment can be pharmacological and non-pharmacological. Pharmacological treatment can be short-term and long-term depending on the patient. Based on this, it is necessary to reduce the symptoms of vertigo and in controlling vertigo has two ways, namely pharmacology and non-pharmacology. In addition to using

drugs, one of the non-pharmacological treatments that can be done independently is by using brandt darrof exercise therapy. This method is an alternative method that can be done in maintaining balance so as to reduce the level/score of vertigo symptoms in sufferers (Hanafia, 2020).

4.2. Discussion

Brandt daroff is a therapy that is very easy to do because it can be done independently at home by people with vertigo, one of the physical therapies that can reduce vertigo symptoms, therapy is carried out in accordance with the dose (SOP) aims to reduce and even eliminate vertigo symptoms in the long term, because brandt daroff therapy can improve blood flow to the brain which can improve the function of balance and performance tools, namely three sensory systems vestibular system, visual system and general sensory system including motion and position. The main goal of vertigo therapy is to achieve optimal quality of life in accordance with the course of the disease, and reduce / eliminate the sensation of vertigo with minimal drug side effects, the implementation of vertigo depends on the duration of complaints and discomfort due to symptoms that arise. In general, this method is very easy to do, which can be done independently at home without the supervision of a doctor or nurse for people suffering from vertigo, this technique can provide a good effect to reduce the level of vertigo by increasing blood to the brain to improve body balance. Brandt daroff therapy is effective for improving the vestibular system that is responsible for maintaining body balance, providing comfort and relaxation, repeated exercises can reorganize the vestibular system (Khoddafi et al., 2022).

Brandt daroff is a habituation exercise aimed at adapting the elderly to the increased gravitational response that causes dizziness when there is a change in head position. Brandt daroff performed according to the correct dosage will reduce or even eliminate vertigo symptoms in the long run. Brandt daroff exercise can improve blood flow to the brain and can improve three sensory systems, namely the visual system, the inner ear balance system (vestibular) and the general sensory system which includes motion, pressure and position sensors (Setiawati & Susianti, 2016).

This research is in line with the research of Herlina & Ibrahim (2018) with the title Effectiveness of Brandt Daroff Exercise on the Incidence of Vertigo in Subjects with Vertigo, showing that the average clinical degree of vertigo complaints experienced by patients before being given brandt daroff exercise therapy for four weeks was 2.64 and the average clinical degree of vertigo complaints experienced by patients after brandt daroff exercise for five weeks was 2.05. The statistical test results obtained a p-value of 0.000, it can be concluded that there is a significant difference in the value of SSS which is faster in the group given brandt daroff exercise compared to the group that is not treated with therapeutic exercises.

This study is also in line with research conducted by Hanafia (2020), entitled The Effect of Brandt Daroff Therapy on Decreasing the Level of Vertigo Symptoms in Vertigo Patients, found that of the 32 respondents before being given brandt daroff therapy who experienced a moderate level of vertigo symptoms as many as 20 people (66.7%), who experienced a severe level of vertigo symptoms as many as 9 people (30.0%) and who experienced a mild level of vertigo symptoms 1 person (3.3%). Meanwhile, after being given brandt daroff therapy, the data obtained were 16 people (53.3%) who experienced mild vertigo and 14 people (46.7%) who experienced moderate vertigo. While after given brandt daroff therapy obtained data that experienced mild vertigo level 16 people (53.3%) and who experienced symptoms of moderate vertigo 14 people (46.7%). Based on the results of the Wilcoxon statistical test showed p-value = 0.000 < α (0.05), meaning that there is an effect of brandt daroff therapy on reducing the level of vertigo symptoms in patients in Pejagan Village, Bangkalan District.

The results of another study conducted by Maliya (2022), entitled The Effectiveness of Brandt Daroff Therapy on Decreasing Vertigo Symptoms in Pejagan Bangkalan Village, Bangkalan Health Center Working Area, showed that there was a difference in reducing vertigo symptoms before and after brandt daroff therapy was given to the treatment group with p-value = 0.000 < α 0.05 (Paired t-test statistical test), there was a difference in reducing vertigo symptoms before and after deep breath relaxation therapy with p-value = 0.043 < α 0.05 (Wilcoxon statistical test). The results of this study found that there was an effect of the effectiveness of brandt daroff therapy on reducing symptoms of vertigo with a p-value = 0.001 < α 0.05 (Independent t-tests statistical test).

There is no gap between theory and the results of this study, the phenomenon that researchers found in the field is that when conducting observations and research patients complain of dizziness spinning around, the body feels weak, feels like the world is upside down, sometimes accompanied by nausea and experiencing balance changes to be an obstacle in providing brandt daroff exercises. The patient did not know how to control vertigo independently. She only used medication and regular rest to reduce her vertigo symptoms. Brandt daroff exercise is proven to reduce vertigo symptoms compared to before. If the patient applies this brandt daroff exercise, it is expected that the patient will be able to control the symptoms of vertigo and increase blood flow to the brain so as to improve balance function. This is because brandt daroff exercise can be done at least 4 times a day (morning, afternoon, evening and night) for at least 3 days continuously and repeated 5 times each for 2 weeks or 3 weeks. This brandt daroff exercise is very effective and easy because it does not require tools and materials that are difficult to obtain. This brandt daroff exercise does not have to be done directly by health workers but can be done independently by patients at home.

According to the researcher at the beginning (the first time) the patient does brandt daroff exercise, it will make the patient feel dizzy when changing positions but this exercise will help the patient to improve balance and reduce symptoms of vertigo.

Based on the description above, the researcher can assume that giving brandt daroff exercise to respondents can reduce or eliminate vertigo symptoms. It is proven that when the researcher gave the brandt daroff exercise to the respondents, all respondents said they were very happy after doing the brandt daroff exercise, the respondents felt more relaxed and comfortable, felt more calm, reduced stress and felt fitter. Respondents also said they wanted to always do brandt daroff exercises and asked the researcher to teach them and other families about brandt daroff exercise techniques so that later they could go home and practice it themselves. According to the researcher, the sense of relaxation and comfort felt by the respondent will help in reducing the patient's vertigo symptoms so that the respondent will not feel dizzy anymore. By doing brandt daroff exercise, it is expected that respondents can neutralize the existence of strange and excessive motion stimuli so that it will reduce the occurrence of recurrence.

In addition, the researcher also assumed that one of the objectives of the researcher providing brandt daroff exercise to patients in Cut Meutia Room, Tk II Iskandar Muda Hospital Banda Aceh is to make patients more relaxed, calm and comfortable and to reduce stress so that it will be able to accelerate the healing process and prevent vertigo recurrence. Therefore, it is important for researchers to provide explanations and education about the importance of doing brandt daroff exercises to patients because brandt daroff exercises must be carried out repeatedly with the correct procedures and carried out for a long enough period of time in order to get maximum results.

5. Conclusion

The study showed a significant difference in the balance of vertigo patients before and after undergoing Brandt Daroff exercise. This proves that Brandt Daroff exercise has a positive influence on the balance of vertigo patients, helps reduce symptoms, and accelerates the recovery process.

Patients who have been discharged from treatment are advised to continue Brandt Daroff exercise at home to reduce vertigo symptoms, increase comfort, and prevent recurrence. In addition, hospital management is expected to provide training and counseling to nurses, as well as education to patients to increase their knowledge in an effort to manage and reduce symptoms of vertigo.

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