The Impact of Core Stability Exercise with the New Bobath Concept Method on Post-Stroke Patient Balance at RSPAL Dr Ramelan Surabaya

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Abstract

Aim : this research aim to know therapeutic exercise appplication with New Bobath Concept approach combining with Core Stability Exercise to improve balance. Quasi experimental design A-B-A use 2 samples measuring every series at a control grup ar RSPAL Dr Ramelan Surabaya. Data analysis with simple descriptive statistic to get obvious image about intervention outcome, using line graphic as an interpretation of treatment and outcome. Based on the grapic shows there is improvement after Core Stability Exercise and New Bobath Concept approach get improvement in 2 items in first week and 2 items in third week. In second week only 1 item get improvement. Conclusion is there is improvement effect in balance by treatment Core Stability Exercise and New Bobath Concept approach.

Keywords : Core Stability Exercise, New Bobath Concept, Balance, Stroke Patiens.

1. PRELIMINARY

Humans are creatures who require movement and move to location in order to carry out daily tasks. The movement is either deliberate or involuntary, depending on the interplay of the external factors. Several diseases, including stroke, can induce movement abnormalities or changes in body functions in people.

Stroke cases have been on the rise in recent years, and it is expected to rise further in the coming years. Stroke is a condition that occurs when the blood supply to the brain is cut off due to a blood vessel blockage or rupture, resulting in the death of cells in certain areas of the brain. Meanwhile, WHO defines stroke as the rapid development of focal and global signs due to impaired brain function that lasts more than 24 hours as a result of vascular disorders in the brain. Stroke patients typically exhibit some of the five stroke symptoms, namely the patient suddenly feels numb/weakness in the face, arms, legs, especially in half of the body; the patient is suddenly confused, most of whom are followed by speech disorders; the patient suddenly has problems with his vision in one or both eyes; the patient suddenly has problems walking, feels dizzy, loses balance and coordination; the patient experiences severe dizziness for no apparent reason. Stroke is a disorder of the central nervous system (CNS). Redundancy and plasticity are two concepts related to the repair function in the CNS organization. Redundancy implies that the CNS has some excess capacity, so that if there is a limited network outage, it can be compensated immediately. Plasticity can be both beneficial and detrimental if neuronal growth goes in the wrong direction and causes additional motor impairment (Luft, 2009).

The consequences of a stroke are determined by the part of the brain that is damaged. The brain is divided into four major sections: the right and left hemispheres, the brain stem, and the cerebellum. The outcome of a stroke is also affected by its type, for example, hemorrhagic stroke versus non-hemorrhagic stroke. Stroke can interfere with a patient's daily activities due to impaired nerve function, which affects muscle strength, body balance, and other body functions in stroke patients (Irfan, 2010).

The ability of the body to maintain balance against gravity and other external factors, to keep the body's center of mass in balance with the plane of support, and to stabilize body parts when other body parts move is referred to as balance. The goal of balance is to protect the body from gravity and other external factors. The sensory information system is one of the balance control components (visual, vestibular and somatosensory systems). Balance factors include center of gravity (COG), line of gravity (LOG), and base of support (BOS) (Irfan, 2010).

The ability to control the movement of the spine (trunk), pelvis, and extremities is impaired in post-stroke patients, making balance disorders very likely. Core Stability Exercise is expected to improve balance and coordination in post-stroke patients by increasing the strength of the core muscles to maintain stabilization.

The Bobath Concept method is a method that focuses on normal movement pattern activities by improving control over postural and selective movements. In motion activities, postural muscle tone has a significant impact on the effectiveness and efficiency of the motion produced. It is hoped that by performing a Core Stability Exercise using the Bobath Concept approach, the postural muscles will be reactivated and the patient's posture and balance will improve (Raine, 2006).

2. METHOD

This study employs a quasi-experimental research design with an A-B-A structure. The ABA design is explained as follows: A1 is the treatment (Core Stability Exercise), B is not the treatment (Core Stability Exercise), but is using other interventions, and A2 is the treatment (Core Stability Exercise) repetition or follow-up after the intervention (Horner et al., 2005).

This study is being conducted at RSPAL Dr Ramelan Surabaya with a sample of two post-stroke patients who are undergoing a therapy program, with the research taking place twice a week for three weeks at the Medical Rehabilitation Poly. Patients with post-stroke who met the inclusion criteria and agreed to participate in this study were the subjects of this study. The following are the inclusion and exclusion criteria:

a. Criteria for inclusion (acceptance)
    1) Is a stroke patient receiving physiotherapy at Dr Ramelan Hospital Surabaya.
    2) Willing to participate in mutually agreed-upon research.
    3) Capable of comprehending the instructions given.
    4) Between the ages of 20 and 65.
    5) Have a Berg Balance Scale pre-test score of less than 46, indicating a balance disorder.
b. Criteria for exclusion (rejection)
    1) Patients with global aphasia are unable to understand what they hear and are unable to communicate.
    2) Hypertension, also known as unstable blood pressure.
    3) There is a decrease in general conditions that do not allow for the application of training.
    4) A history of restrictive lung disease, asthma, tuberculosis, lung tumors, or other life-threatening complications.

The ability of the trunk, lumbar spine, pelvis, hip, abdominal muscles, and small muscles along the spine are all used in Core Stability Exercise. All of these muscle and joint movements combine to create a force that aims to keep the spine aligned with a symmetrical body line and become more stable. When the spine is strong and stable, it makes it easier for the body to move effectively and efficiently, which affects the body's level of balance. The Bobath Concept's objectives are as follows:

1. Determine which areas of the antigravity muscles have decreased tone.
2. Improve proprioceptive input ability
3. Recognizing each person's functional impairment and being able to perform "Normal" efficient function activities
4. Promote specific motor activity
5. Reduction of compensatory movements as a result of movement disorders
6. Determine when and how movement becomes more efficient.

Ann Thomson defines balance as the ability to maintain the body in an equilibrium position, whether static or dynamic, with minimal muscle activity. Balance is classified into two types: static balance and dynamic balance. Static balance is the ability of the body to maintain equilibrium in a fixed position (such as standing on one leg or on a balance board) while dynamic balance is the ability to maintain balance while moving. Balance is a complex interplay of sensory systems (vestibular, visual, and somatosensory, including proprioceptors) and musculoskeletal (muscles, joints, and other soft tissues) that are

modified / regulated in the brain (motor control, sensory, basal ganglia, cerebellum, association area) in response to changing internal and external conditions. Other factors that influence it include age, motivation, cognition, environment, fatigue, drug effects, and previous experiences.

The study's data came from primary data sources, which were obtained through direct observation and measurement of the subject. In this study, the type of data is numerical data, specifically the value of static and dynamic balance capabilities. Data processing in this study aims to obtain a subject's data information, which will be assessed as a result of the subject's balance test scores via the Berg Balance Scale.

The final stage before drawing conclusions is data analysis. The data from a quasi-experimental study with an A-B-A design were analyzed using a simple descriptive statistical test in order to obtain a clear picture of the outcomes of the intervention with a certain distance. By illustrating the implementation and experimental results with a line graph. The goal of the ABA design intervention is to determine the value of the effect of providing Core Stability Exercise with the New Bobath Concept method versus not providing Core Stability Exercise action with the New Bobath Concept method, whether there is a change in the effect of the progress of the difference in the treatment value, which will later be evaluated by Berg Balance Scale parity.

3. RESEARCH RESULTS AND DISCUSSION

3.1. Introduction

Patients undergoing outpatient therapy treatment at the Medical Rehabilitation Poly RSPAL Dr Ramelan Surabaya were sampled for this study. After the examination, it was discovered that two patients were given the Core Stability Exercise approach with the Bobath Concept approach in the first and third weeks, and were given in addition to the Core Stability Exercise action in the second week. Researchers only obtained two samples of patients until the end of the study because the majority of the patients were BPJS participants, so there were many patients who had previously died because the treatment schedule at the specialist polyclinic was only given twice a week. The two patients (Mr. S and Mr. P) were able to complete the research program to completion, for two meetings per week for three weeks in a quasi-experimental study with ABA design, and the data were analyzed using a simple descriptive statistical test with the goal of obtaining an overview. clearly about the intervention's results with a certain distance by using a line graph an overview of the implementation and experimental results.

3.2. Respondent Characteristics

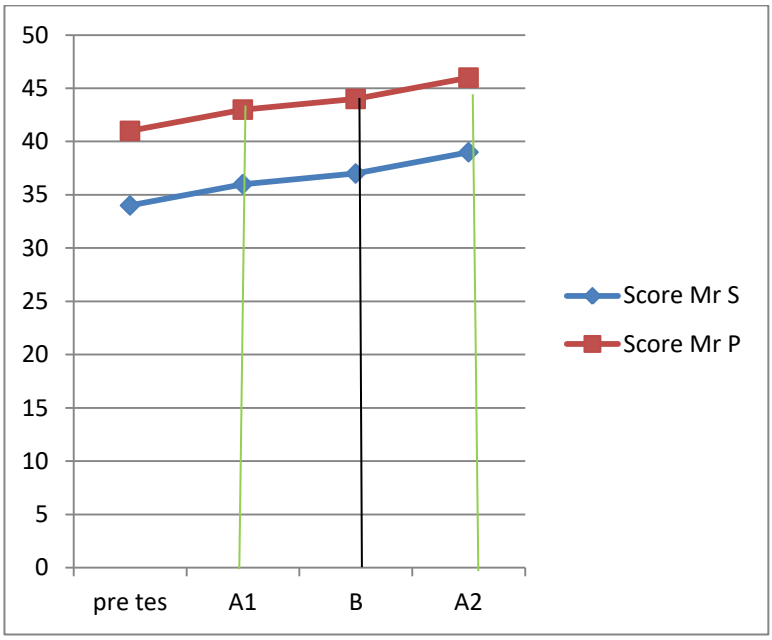
Number	Name	Age	Gender	Type of Stroke	Outbreak	Period	Lesion Side
1.	Mr. S	57 yrs old	L	Non-hemorrhagic	First	12 months	kanan
2.	Mr. P	61 yrs old	L	Non- hemorrhagic	First	16 months	Kiri

Table 3.1. Table of Patient Characteristics

3.3. Research Results Discussion

The overall study of patients with Mr. S and Mr. P revealed an increase in development and differences in BBS values for 2 treatments in 1 week for 3 weeks with

the treatment results from the Core Stability Exercise action on balance with the New Bobath Concept approach, and the table of research results was obtained as follows:



Graph Table 3.1. Mr. P and Mr. S (A1-B-A2)

Mr. P shows an increase in the graph of the development of BBS scores from the first week of pre-test to the third week, the results of the addition of the pre-test BBS value of 41, and increasing to 43 BBS values in the first week after being given Core Stability Exercise treatment with New Bobath Concept method, from the results of the research graph table above. The BBS value increased to 44 in the second week after being given treatment other than the Core Stability Exercise with the New Bobath Concept method, and in the third (last) week after being given the Core Stability Exercise treatment with the New Bobath Concept method again, the BBS value increased to 46 from the Berg Balance Scale test, which was held for two meetings a week.

According to the research graph table above, there is an increase in the graph of the development of Mr. S's BBS value from the pre-test to the first week to the third week, the results of the addition of the BBS pre-test value of 34 increasing to a BBS value of 36 after receiving Core Stability Exercise treatment with the New Bobath Concept method during the first week. The BBS value increased to 37 in the second week after being given treatment other than Core Stability Exercise with the New Bobath Concept method, and the BBS value increased to 39 in the third (last) week after being given Core Stability Exercise treatment with the New Bobath Concept method again in the third week of Berg Balance Scale testing, which was done twice a week.

Based on the table graph conclusion and the Berg Balance Scale developmental value, it was discovered that the similarities in the BBS value development values for the two patients increased by 2 BBS values in the first week, 1 BBS value in the second week, and 2 more BBS values in the third week. The enthusiasm and consistency of the two patients in undergoing therapy in the study every week, as well as the spirit of interpersonal motivation (competition) of the two patients in undergoing therapy during

the study, were the development factors for the increase in the two patients. While the differences in the functional ability of the patient's body Mr. P and Mr. S in conducting balance research using the Berg Balance Scale measuring instrument are obtained from several factors causing the functional body of Mr. P and Mr. S after stroke, in Mr. P. his body's functional ability is better than Mr. S. in Mr. S, this is one of the differences in the functional ability of the patient's body Mr. P and Mr. S in conducting balance research using the Berg Balance Scale measuring instrument.

Both patients, Mr. S and Mr. P, showed an improvement in their balance after receiving Core Stability training with the New Bobath Concept method twice a week for three weeks using the A-B-A design and the Berg Balance Scale parameter. The training objectives of the program are expected to increase the stability of the pelvic region and strengthening exercises for the abdominal muscles, as well as the postural and hip muscles, which are considered basic exercises to improve stability or balance and spine stabilization. An increase in core muscles can also cause an increase in nerve conductivity, which can improve intermuscular coordination and reaction speed, resulting in increased work mobility in the balance function.

The results of the development of an increase in value from the provision of Core Stability Exercise with the New Bobath Concept method approach at 1 item value of BBS standing unsupported, 1 item value standing with one foot in front of the other, 1 item transfer value, and 1 value Items turn 360 degrees were obtained from the patient Mr. S. While the provision of treatments other than Core Stability Exercise with the Bobath Concept approach resulted in 1 BBS item value being obtained from standing to sitting in the second week, this may still have the effect of providing Core Stability Exercise with the New Bobath Concept approach in the previous meeting. So, when compared to other treatments, there is a better improvement with the provision of Core Stability Exercise with the New Bobath Concept approach, and there is progress in improving balance and postural control.

After administering the Core Stability Exercise with the New Bobath Concept approach to the patient Mr. P, it was discovered that there was an increase in 1 BBS item value standing unsupported, 1 BBS item value standing with one foot in front of the other, 1 BBS item value standing to sitting, and 1 BBS item value placing feet alternately on the beam (step stool). Giving anything other than the Core Stability Exercise with the New Bobath Concept approach in the second week, 1 BBS item value, the BBS item value sitting to standing, may still have an effect on giving the Core Stability Exercise with the New Bobath Concept approach in the previous meeting. As a result, it can be concluded that the provision of Core Stability Exercise with the New Bobath Concept approach results in better improvement than other treatments, and there is progress in improving balance and postural control for body balance.

It is very possible to activate and stimulate responses in the brain because the brain has a very special nature, namely the brain is an organ that is easy to adapt even if the neurons in the brain have been damaged or have not regenerated. The ability of the brain's neuroplasticity and neurogenesis to take over the function of damaged parts allows certain parts of the brain to take over the function of the damaged parts. As a result, parts of the brain enjoy learning new skills. This is the most important mechanism involved in stroke recovery (Selzer et al., 2006). Although the peri-infarction area becomes more neuroplastic, allowing repair of sensory function to remap

the damaged area of the brain, stroke is associated with limited recovery of brain function. As a result, there is a need for coordination between the role of physiotherapy and post-stroke patients in undergoing a therapy program to build coordination and joint treatment.

At the end of the Berg Balance Scale evaluation session, there were several increases in the value of the same BBS item from both patients, namely standing unsupported and standing one foot in front of the other. This demonstrates that the increasing relationship between the Center of Pressure in Postural Stability Central of Pressure (CoP) describes postural stability, a balanced pedestal depicts that a person is in a stable position, and the more balanced the pedestal in the optimal position, the more stable and balanced. A well-balanced CoP is critical in preparing for the next functional activity. When standing, a balanced pedestal will facilitate additional functional activities such as walking, reaching, and sitting to standing. In postural stability, CoP connects BoS and CoG.

According to Anne Shumway Cook (2007), the amount of Base of Support (BoS) will increase the stability to respond to an impact or force that comes to our body, we tend to widen the distance of support of both legs. In some cases, simply widening the BoS is insufficient to increase stability; instead, the right direction of body style is required. The ground contact point, which is a reflection of stability in a standing position with both feet supported, can be used as a reference.

As a result, the relationship between the Center of Pressure in Postural Stability Central of Pressure (CoP) describes postural stability, with a balanced pedestal demonstrating that a person is in a stable (balanced) position and increasing the Base of Support of both patients can be concluded as a result of the administration of the influence of Core Stability Exercise with the New Bobath Concept Method approach, both patients experienced the same increase in value of motion of the same balance function from the evaluation results using the BBS (unsupported standing item and standing one foot in front of the other).

Based on the analysis of the research and the discussion, it is possible to conclude that there is an effect on balance in post-stroke patients after being given Core Stability Exercise with the New Bobath Concept method approach. According to the findings of the research patients, there was an increase in functional activity and balance in the bodies of stroke patients.

4. CONCLUSION

The Medical Rehabilitation Poly RSPAL Dr Ramelan Surabaya conducted research on the effect of Core Stability Exercise with the New Bobath Concept approach on the balance of post-stroke patients from 7-24 March 2021 with a number of research subjects 2 post-stroke patients receiving treatment twice a week. Based on observations from research with parameter values using the Berg Balance Scale, it was concluded that the Core Stability Exercise with the New Bobath Concept approach had an effect on increasing balance once a week for three weeks. Based on the results of the Berg Balance Scale research, there is an increase in the value of the 14 test items that have been performed, indicating an increase in balance.

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