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DUAL TAKS TRAINING THERAPY TO REDUCE PHYSICAL MOBILITY DISORDERS IN MRS.T WITH STROKE AT CHUZAN HOSPITAL OKINAWA JAPAN

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ABSTRACT

Stroke causes weakness in the limbs. Weakness experienced by stroke patients can be in the form of hemiplegia, plegia, or paraplegia. Dual task training is a non-pharmacological management of physical mobilisation disorders. Objective: This case study aims to determine the effectiveness of dual task training in patients with impaired physical mobility due to stroke. Method: The type of research in this case study is descriptive. The subject of this case study was Mrs T aged 60 years, a stroke patient with nursing problems of physical mobility disorders in room 2B. Elderly with impaired physical mobility due to stroke will be given dual task training therapy, namely walking using a pyramid A stick in order to maintain balance and increase mobility. To determine the effectiveness of the therapy provided, the author conducted an assessment with the parameters of the breg balance scale (BBS). Results: The results of the initial score before therapy showed a BBS score of 18 points which means that you have to use a wheelchair (wheelchair bound), then after the dual task training therapy action carried out by Mrs T for 3x30 minutes / day carried out for 3 consecutive days, the final result was 32 points which had the interpretation of walking with assistance. Conclusions: The results of the case study show that dual task training therapy is effective for reducing the patient's physical mobility disorder.

Keywords: breg balance scal; dual task training; stroke

INTRODUCTION

A stroke occurs when the blood supply to the brain is interrupted. In most cases, the blood supply to the brain is interrupted when a blood vessel in the brain is damaged or blocked by blood (Mauliddiyah et al., 2022). According to data from the World Stroke Organisation, there are 13.7 million new cases of stroke and 5.5 million deaths caused by stroke every year from the last 15 years of data. Not only the elderly have the potential to experience stroke, many young people also suffer from this stroke medical problem due to various causes such as staying up late, irregular work life, anxiety, unhealthy eating habits, overthinking, and so on (Sun et al., 2021). In Japan stroke is ranked fourth in causes of death, and is also one of the leading causes of physical disability and congitive dysfunction (Hata & Ninomiya, 2023). In Japan, stroke is the disease that requires the most treatment with a treatment percentage of approximately 30 per cent of all diseases. As evidenced by the cost of medical care for stroke is predicted to reach approximately 1.7 trillion yen (175 trillion rupiah), while the cost of stroke treatment is approximately 1.9 trillion yen (196 trillion rupiah). Therefore, stroke has a major effect on society and the economy in Japan. Then the Japanese government stepped in with the first legislative action for stroke, the legislative step is that in December 2018 the Japanese government published a law on controlling cerebrovascular and cardiovascular diseases, this step was taken in the hope of preventing the increase in stroke sufferers by disseminating more accurate information about stroke. As of July 2021, according to the Japan Stroke Data Bank (JSDB), 240,000 stroke patients from 132 hospitals have been recorded (Wada et al., 2023).

Dual task training is an intervention that brings together motor skills and cognitive abilities that are practiced together with the hope of improving body functions such as walking ability, reaction speed, balance, and reducing the risk of falls, as well as increasing the patient's physical mobility (Syarif et al., 2022). One of the therapies of dual task training is walking using pyramid A stick rocks collaborated with counting numbers in reverse. From several studies conducted by previous researchers, it was found that there was a significant effect of dual task training on improving motor function and activities of daily living in stroke patients with hemiplegia. Therefore, the application of dual task training in stroke rehabilitation is highly recommended to improve the physical mobility, function and overall independence of stroke patients with hemiplegia. Dual task training is a type of therapy that involves performing two or more tasks simultaneously or in combination. Dual task training therapy can help hemiplegic stroke patients restore their ability to perform daily activities more efficiently and independently. Based on the background above, the authors are interested in conducting research on the effectiveness of dual task training therapy walking with a pyramid A stick for the elderly with stroke (Syarif et al., 2022).

Dual-task training is defined as an intervention that combines motor and cognitive tasks performed simultaneously, which allows for improved recognition of impairments and accelerated return to function. This training is effective in improving walking ability, reaction speed, balance and increasing the physical mobility of patients. Combining motor and cognitive activities has more synergistic effects than providing motor and cognitive training separately. Giving dual-task training for 3x30 minutes / day in 3 consecutive days or 3 times a week for 3 weeks is proven to improve balance and increase physical mobility in stroke patients. In a study conducted by (Salahuddin Rai et al., 2020) giving exercise 5 times a week for 30 minutes for 2 weeks, there were significant positive results on executive function and balance. By increasing balance and increasing physical mobility in patients can improve body balance in stroke patients (Syarif et al., 2022).

Basically, there are various types of interventions or modalities that can be performed on stroke patients according to the problems found during the examination. One of the interventions that can be used as a hemiplegic stroke treatment to improve the physical mobility of patients is the provision of exercise therapy in the form of dual task training which is measured by the final result using the Breg Balance Scale (BBS) parameter. Dual task training is a balance exercise aimed at improving balance control by developing complex integration between sensory (visual, vestibular, somatosensory) and motor systems with regulation by the central nervous system in maintaining the balance of joint work when the body moves so as to reduce the risk of falling in carrying out activities in daily life (Pratama, 2021).

The Berg Balance Scale (BBS) is a balance measurement tool that assesses balance and fall risk in adults. The BBS consists of 14 items with an ordinal scale of 0 to 4 for a total of 56 points (lower scores indicate a higher risk of falling). A score of zero indicates the lowest level of function and a score of 4 indicates the highest level of function and takes approximately 20 minutes to complete. The items evaluated range from static positions with increasing difficulty by reducing the base of support to dynamic activities. The BBS is designed with content that closely resembles real-life activities, making it easy to learn and allowing for repeated evaluation. BBS requires modest cost, time, and equipment. Moreover, even patients in the acute phase of stroke, many of whom may not be able to sit or stand, can undergo assessment, highlighting its advantages. The clinical utility of the BBS includes the ability to estimate rehabilitation outcomes using the total score of the scale.

Research into rehabilitation outcome estimation shows that the score measured on admission using the BBS is inversely proportional to the length of hospitalisation and can predict the duration of hospitalisation and discharge decisions (Joa, 2024). Indications in the implementation of dual task training therapy are patients who have a history of neurological problems or post-stroke patients where patients have problems with their balance and walking patterns, patients who have a history of cognitive impairment, have a history of joint injuries that can complicate the patient's walking patterns and body balance. Contraindications in this therapy are patients who have decreased consciousness and inability to stand (Purnamasari et al., 2019).

METHOD

This case study research was conducted on Mrs T who was 60 years old with complaints of physical mobility disorders with a case management approach to the description of the impact of dual task training therapy, namely walking with a pyramid A stick in stroke patients on body balance accompanied by a nursing process approach consisting of 5 stages, namely assessment, nursing diagnosis, nursing intervention, nursing implementation, and nursing evaluation.

RESULTS AND DISCUSSION

From the results of the assessment obtained by the patient on behalf of Mrs T with the age of 60 years with female gender, the results of the anamnesis assessment to Mrs T and the patient's child obtained information that Mrs T experienced weakness in the left hand and left leg, the patient used a wheelchair in her activities, the patient had a history of hypertension, current complaints to experience weakness in the left extremity, difficulty in doing activities independently, speaking slowly. The patient's left hand muscle tone strength is 2222, right hand 5555, left foot 2222, and right foot 5555. And the results of the Berg Balance Scale (BBS) assessment before therapy got a value of 18 which means that it must use a wheelchair (wheelchair bound). The results of the physical examination obtained Mrs T's general condition was moderate, CM level of consciousness, GCS 14 (E4, M6, V4), BP: 139/90 mmHg, SpO2: 96%, RR: 19x/m and temperature: 36,8OC.

Based on the case study of nursing care for the elderly, the researcher will discuss the effectiveness of dual taks training therapy walking with pyramid A sticks in maintaining body balance due to physical mobility disorders in Mrs.T which is the first priority that the author gets in the results of case management at the beginning of 2 February 2024 by going through several stages of the nursing process including assessment, nursing diagnosis, nursing intervention, nursing implementation, and nursing evaluation. Nursing assessment is an act of reviewing the human situation to obtain data about the client with the intention of confirming the disease situation (Novera, 2021). The author conducted an assessment of Mrs T on 2 February 2024 and found that the patient experienced weakness of the left extermity and experienced physical mobility disorders. Mrs A experiences limitations in carrying out daily activities, so activities require the assistance of a nurse. The strength of the patient's left hand muscle tone is 2222, right hand 5555, left foot 2222, and right foot 5555. And the results of the Berg Balance Scale (BBS) assessment before therapy got a value of 18 which means that it must use a wheelchair (wheelchair bound). Based on the results of this assessment, it shows signs of symptoms such as impaired physical mobility, weakness of limbs, or limitations in carrying out daily activities.

Nursing Diagnosis

The existing nursing problems experienced by the patient are physical mobility disorders, risk of skin / tissue integrity disorders, verbal communication disorders. The priority nursing diagnosis in accordance with Mrs T's case is impaired physical mobility associated with neuromuscular disorders. Based on the SDKI, the major symptoms and signs are complaining of difficulty moving the extremities, appearing decreased muscle strength, decreased range of motion (ROM). While the minor signs and symptoms are pain when moving, reluctance to move, feeling anxious when moving, appearing stiff joints, uncoordinated movements, limited movement, physical weakness. This case is in line with the research of Siti Nor Khofifah and Wahyudi Widada (2023) that symptoms that are easily recognised if someone has a stroke are difficulty moving the extremities, aphasia (difficulty speaking), asymmetrical lip position, difficulty swallowing, decreased or loss of consciousness, to paralysis (Khofifah & Widada, 2023).

Nursing Intervention

Nursing care interventions that will be carried out by researchers to address the problem of identifying exercise risks, identifying the type and duration of exercise activities, monitoring TTV before and after exercise, monitoring the effectiveness of dual task training exercises, do the exercise according to the specified program (do dual task training therapy / walking therapy with pyramid A sticks with counting numbers backwards done by walking 50 meters x 1 set, 70 meters x 1 set, and 100 meters x 1 set (distance is developed gradually), facilitate patient mobilisation activities with pyramid A stick aids, provide written instructions on guidelines and forms of movement for each muscle movement, explain the purpose and procedure of mobility / dual task training therapy walking with pyramid A sticks by counting numbers backwards, teach signs and symptoms of intolerance during and after exercise sessions (eg. weakness, extreme fatigue, angina, angina, etc.). weakness, extreme fatigue, angina, palpitations, collaborate with other healthcare teams (e.g. activity therapist, exercise physiologist, occupational therapist, recreational therapist, physical therapist) in planning, teaching and monitoring the muscle exercise programme.

The effectiveness of dual task trining in overcoming the problem of physical mobility disorders is proven by the research of Syarif et al (2022) the value of the risk of falling in post-stroke patients at the Bekasi Stroke And Parkinson Center Clinic before being given dual task training exercises averaged 15.44 seconds and the value after being given dual task training exercises averaged 11.88 seconds, but if the average value is categorised as still at moderate risk of falling, there is an effect of dual task training on reducing the risk of falling in patients.

Nursing Implementation

The nursing problem of impaired physical mobility due to stroke can be minimised by dual task training therapy, namely walking using a pyramid A stick collaborated with counting numbers backwards. Dual task training therapy is carried out for 3x30 minutes / day for 3 consecutive days in line with the implementation of the therapist / rehabilitation of Chuzan Hospital, Okinawa City, Japan.

Table 1.
Berg Balance Scale (BBS) Characteristics

Characteristics	Value
number of items	14 items
Score	56 score
Time to complete	20 minutes-30 minutes
Minimal clinically important differences	13.5

Table 2.
Breg Balance Scale Assessment Results

Balance Item	Score (0-4)	
	Before	After
Sit to stand	2	3
Standing without support	1	2
Sitting without support	3	4
Standing to sitting	3	4
Transfer	3	4
Standing with eyes closed	0	2
Standing with feet together	1	2
Reaching forward with hands	1	2
Picking up items on the floor	2	3
Looking back	1	2
Fade 360 degrees	0	1
Placing alternate feet on the bench	0	1
Standing with one foot in front	0	1
Standing with one foot	1	2
Score	18	32

Description:
Total score =56
Interpretation
0-20 must use a wheelchair (wheelchair bound)
21-40 walking with assistance
41-56 independent

Nursing Evaluation

Evaluation is a nursing action that measures the extent of the success of nursing actions based on the response shown by the patient. In this case, the author used the breg balance scale (BBS) evaluation method and was carried out at the beginning on the first day before the therapy of dual task training therapy walking with a pyramid A stick and at the end of the terpai session on the 4th day where the day was devoted to taking the value of the results of providing dual task training therapy. Nursing evaluation in this case study is carried out in two types of evaluation, namely formative evaluation or outcome response carried out immediately after taking action and summative evaluation or development carried out after action by comparing the patient's response with predetermined goals using the SOAP method, namely S (Subjective), O (Objective), A (Analysis), P (Planning).

Evaluation of the third day's development with nursing diagnoses of impaired physical mobility associated with neuromuscular disorders (S) the patient said he could shift and lift his left leg slowly and could tilt right and left independently, (O) the patient looked fresher, the patient's level of consciousness seemed CM (E4, M6, V5) - TTV: BP: 135/90 mmHg, HR: 100x/min, RR: 20x/m, SpO2: 99% Temperature: 36.60C. with the results of the muscle tone assessment increasing quite significantly. (A) Physical mobility disorders related to neuromuscular disorders have not been resolved, (P) Intervention continued with dual task training therapy continued by Chuzan Hospital therapist staff.

CONCLUSION

The results of the study showed that dual task training was effective in overcoming balance problems due to physical mobility problems due to stroke, indicated by the results of the breg balance scale (BBG) assessment before therapy on the first day showed a score of 18 points which had walking using a wheelchair and after dual task training was carried out, the final BBG result was 32 points which had the interpretation of walking with assistance. The final result of the intervention has not been resolved and further dual task training therapy will be carried out by the staff therapist (PT) of Chuzan Hospital.

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